DOCUMENT RESUME

ED 178 290 SE 028 483

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TITLE	Individualized Testing System: Performance Checks, ISCS Level III, WW-CP Form B.
INSTITUTION	Florida State Univ., Tallahassee. Curriculum Study Center.
SPONS AGENCY	National Science Foundation, Washington, D.C.
PUB DATE	73
NOTE	74p.; For related documents, see SE 028 460-488
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	Academic Achievement; Course Evaluation; Elementary Secondary Education; *Evaluation; *Individualized Programs; Junior High Schools; *Performance Tests; *Science Course Improvement Project; Science Education; Science Materials; Science Tests; *Student Evaluation
IDENTIFIERS	*Intermediate Science Curriculum Study; *National Science Foundation

ABSTRACT

This is one form of three performance checks booklets (A, B, and C) for two texts of level III of the Intermediate Science Curriculum Study (ISCS). These two texts are Winds and Weather (WW), and Crusty Problems (CP). The 12 performance checks booklets for Level III are considered one of four major subdivisions of a set of individualized evaluation materials for Level III of the ISCS. This booklet (form B), developed to assess the students' achievement of the objectives of WW and CP of Level III, contains a set of performance checks which are equivalent to the performance checks of the other two forms (A and C). Each performance check has its own code number which indicates the unit number and identifies whether it is based on core material or excursions. Directions for students' use of performance checks are also included. (HM)

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INTERMEDIATE SCIENCE CURRICULUM STUDY

ISCS

ED178290

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INDIVIDUALIZED TESTING SYSTEM

Performance Checks

ISCS LEVEL III
WW-CP
FORM B

SE 028 483

SILVER BURDETT
GENERAL LEARNING CORPORATION
Morristown, New Jersey · Park Ridge, Ill. · Palo Alto · Dallas · Atlanta

INDIVIDUALIZED TESTING SYSTEM

ALL LEVELS
Individualizing Objective Testing (an ITP module)
Evaluating and Reporting Progress (an ITP module)

LEVEL I
Performance Objectives, ISCS Level I
Performance Checks, ISCS Level I, Forms A, B, and C
Performance Assessment Resources, ISCS Level I, Parts 1 and 2

LEVEL II
Performance Objectives, ISCS Level II
Performance Checks, ISCS Level II, Forms A, B, and C
Performance Assessment Resources, ISCS Level II, Parts 1 and 2

LEVEL III
Performance Objectives, ISCS Level III
Performance Checks, ISCS Level III, ES-WB, Forms A, B, and C
WYY-IV, Forms A, B, and C
IO-WU, Forms A, B, and C
WW-CP, Forms A, B, and C
Performance Assessment Resources, ISCS Level III, ES-WB
WYY-IV
IO-WU
WW-CP

ACKNOWLEDGMENTS

The work presented or reported herein was supported by funds provided by the National Science Foundation. However, the opinions expressed herein do not necessarily reflect the position or policy of the National Science Foundation, and no official endorsement by the agency should be inferred.

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FOREWORD

To implement an educational approach successfully, one must match the philosophy of evaluation with that of instruction. This is particularly true when individualization is the key element in the educational approach. Yet, as important as it is to achieve this match, the task is by no means simple for the teacher. In fact, without specific resource materials to help him, he is apt to find the task overwhelming. For this reason, ISCS has developed a set of individualized evaluation materials as part of its Individualized Teacher Preparation (ITP) program. These materials are designed to assist teachers in their transition to individualized instruction and to help them tailor their assessment of students' progress to the needs of all their students.

The two modules concerned with evaluation, *Individualizing Objective Testing* and *Evaluating and Reporting Progress*, can be used by small groups of teachers in in-service settings or by individual teachers in a local school environment. Hopefully, they will do more than give each teacher an overview of individualized evaluation. These ITP modules suggest key strategies for achieving both subjective and objective evaluation of each student's progress. And to make it easier for teachers to put such strategies into practice, ISCS has produced the associated booklets entitled *Performance Objectives, Performance Assessment Resources,* and *Performance Checks*. Using these materials, the teacher can objectively assess the student's mastery of the processes, skills, and subject matter of the ISCS program. And the teacher can obtain, at the moment when they are needed, specific suggestions for remedying the student's identified deficiencies.

If you are an ISCS teacher, selective use of these materials will guide you in developing an individualized evaluation program best suited to your own settings and thus further enhance the individualized character of your ISCS program.

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NOTES TO THE STUDENT

Now that you have completed several chapters, excursions or resources, and self-evaluations, you are ready to help your teacher determine how well you are doing. The performance checks in this book will provide your teacher with this information. Then your teacher can help you with things you may not understand and can keep a record of your progress.

Read the next section carefully. It explains some important things about the performance checks in this book, and it gives you specific suggestions for using them.

What You Need To Know about Performance Checks

1. **You do performance checks when you are ready.** Performance checks are somewhat like the questions in the self-evaluations – you do them when you are ready, not when the whole class is ready.
2. **Your teacher or both of you decide how many you do.** Your teacher or you and your teacher together will decide which ones you should do. You are not expected to do all of the performance checks.
3. **There are three forms for each performance check.** Every performance check is written in three forms – A, B, and C. (The title of this booklet tells you whether it is Form A, B, or C.) Usually the answers for each form are different. When you do a check, you will use only one form. The A, B, and C forms are always in different booklets. Within each booklet all the performance objectives for the same unit are listed together. A unit contains two or three chapters and their related excursions or resources. These units are in numerical order. Each unit has performance checks based on core material and performance checks based on excursions or resources.
4. **Each performance check has its own number.** The number is in the outside margin of the page and will look like this: WW-03-Core-17A, WW-01-Exc 2-1-2A, CP-03-Core-17A, or CP-01-Res 3-2A. These numbers mean

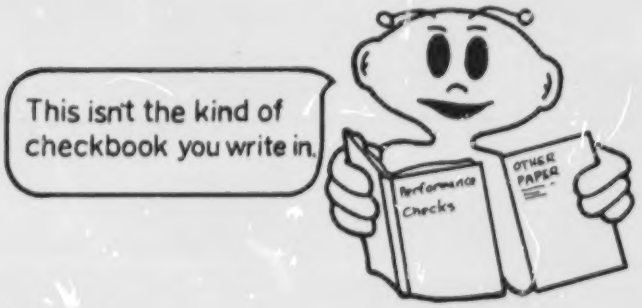
WW	-	03	-	Core	-	17	A	and	WW	-	01	-	Exc	2-1	-	2	A
text		unit		based on core material		check number	form of the check		text		unit		resource material—excursion material	resource number—excursion number		check number	form of the check
CP	-	03	-	Core	-	17	A	and	CP	-	01	-	Res	3	-	2	A

5. **Each performance check is separated from the other.** There is a line before each performance check and one after it. Some performance checks have several parts, so do everything called for between the lines. If there is no line at the bottom of a page, the check is continued onto the next page.

6. **Sometimes you will need to use equipment.** If special materials are needed, they will be in boxes labeled with the same number and sometimes the same letter too as the performance check for which you need them.

7. **Some performance checks have two or more answers.** If more than one answer is correct, you must select all the correct choices. In such cases, selecting just one answer is not enough.

8. **Some performance checks have no answers.** Occasionally, you may be asked to do something that is impossible and to explain your answer. If so, say that the task is impossible and explain why.



9. **You share books of performance checks and YOU DO NOT WRITE IN THEM.** Write your answers on other paper. Give the number and form of the performance check for each answer you write. If you are to draw a graph, a chart, or a map, your teacher may provide you with grid paper or a copy of the chart or map.

10. **Your teacher or his assistant will collect and mark your checks.** And sometimes you must ask him to watch or assist you as you do a check.

11. **Sometimes a review procedure will be suggested.** If you can't do a performance check, you may be asked to review a part of the text or a self-evaluation question. You may then be checked on the same material, so be sure you understand the material you review. Get help if you need it.

Winds and Weather

WW

Tanya put a tray of hot water in a sealed observation box, as shown below. The dots represent air particles.

WW
01-Core-1B

Diagram a.

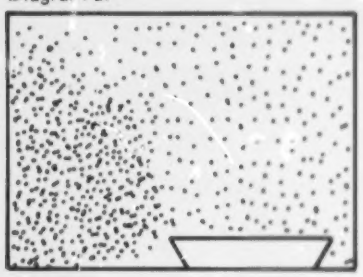


Diagram b.

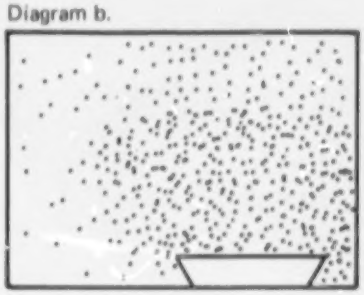
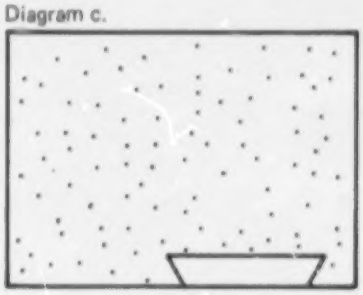


Diagram c.



1. Which of the diagrams above best represents how the air particles will be scattered in her observation box?
2. Explain the reason for your choice.

The diagrams below show three boxes. They are open at the bottom and contain air. The air particles are represented by the small dots.

WW
01-Core-2B

Diagram a.

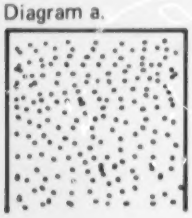


Diagram b.

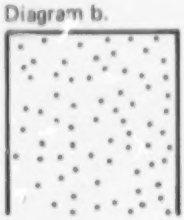
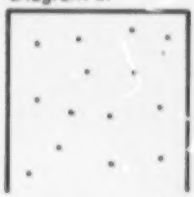


Diagram c.



1. Which of the boxes contain the warmest air?
2. Explain your answer. In your explanation, use the things that the particle model says about heat and matter particles.

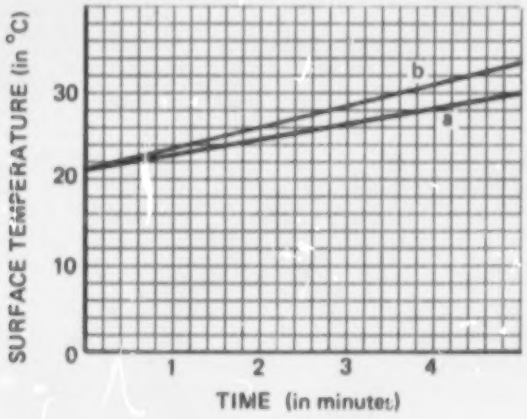
While at the seashore on a sunny day, you notice a woman sunbathing. A little later you see her pouring some water onto her body. A practical reason for her action would be that

WW
01-Core-3B

a. her suit was dirty, so she decided to wash it.
b. she believes that water spread on her body will cool her body.
c. she believes that water will make her body hotter and therefore cause her to tan more quickly.
d. the water on her body will make others think she has been swimming.

WW
01-Core-4B

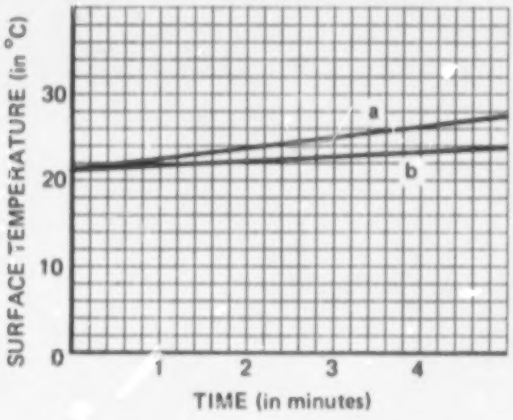
Isaac measured the surface temperature of two different dry plastic boxes several times after he had placed them in sunlight. One box was white; the other was dark blue. He plotted their surface temperatures on the grid below.



1. Which graph (line), a or b, represents the surface temperature of the white box?
2. Explain your choice.

WW
01-Core-5B

Carla placed two containers of soil in sunlight. One was filled with wet soil and the other with dry soil. She then measured the temperature in the two containers and plotted her data as shown below.



1. Which of the two graphs (lines), a or b, represents the surface temperature of the wet soil?
2. Explain your answer.

Arrange the following events in the order in which they occur. **WW 01-Core-6B**

1. The lake and the land warming at different rates
2. The air above the lake warming more slowly than the air above the land
3. An up-and-down motion of the air above the land and the lake
4. The sun heating the lake and the land

Jane went outside on a sunny, calm day to measure the temperature of the air in four different unshaded places near her home. She measured the air temperatures above the following surfaces. **WW 01-Core-7B**

a. The black asphalt driveway
b. The grass-covered lawn
c. The moist, black soil in her garden
d. The light-colored concrete sidewalk

Above which surface would she record the highest air temperature?

One day while observing an eagle circling over a meadow, Dick noticed a peculiar thing. Although the eagle did not flap its wings once during the ten minutes he watched, it kept rising higher and higher in the sky. Explain how it is possible for the eagle to stay up and even to rise without flapping its wings. **WW 01-Core-8B**

One day in science class, Wilma and Betty disagreed as to how the air and surfaces were heated. Wilma said that the sun first heated the air and this hot air then heated the surface below it. Betty thought that sunlight first heats a dark-colored surface and that this warm surface then heats the air above it. State a plan to find out who is correct. **WW 01-Core-9B**

Go to the weather instrument that your teacher has set up in the classroom. Make the readings from the weather instrument, and record them on your answer paper. **WW 01-Core-10B**

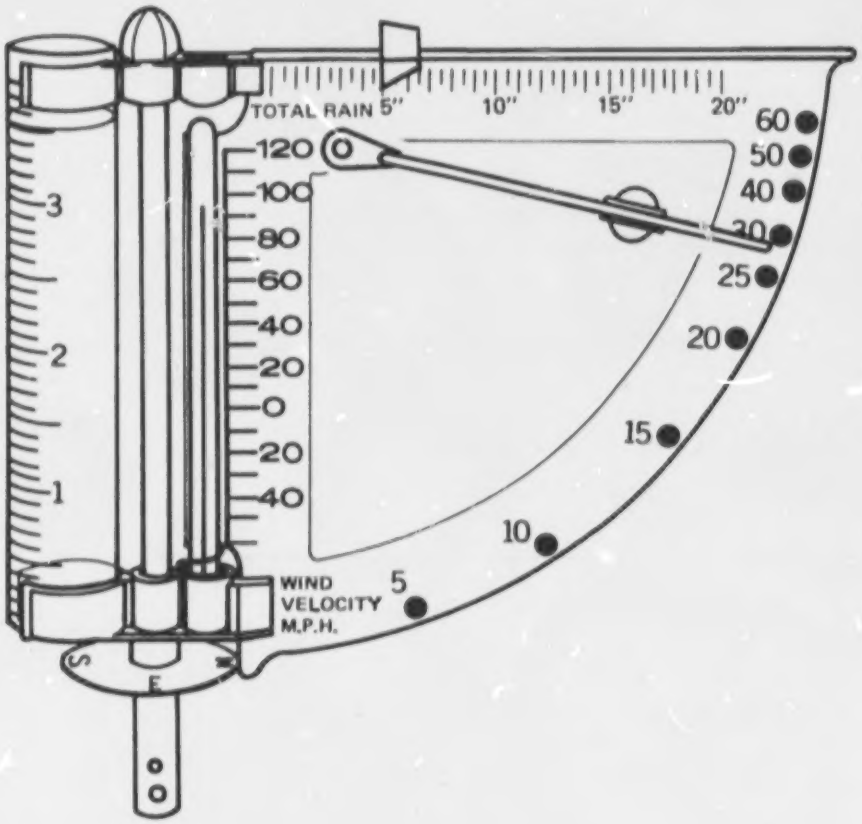
Which of the variables below can be controlled in weather watching? **WW 01-Core-11B**

a. Temperature
b. Inches of snowfall
c. Wind speed
d. Wind direction
e. Time of day you take the readings

Why is it important to make your weather-watch measurements at the same time each day? **WW 01-Core-12B**

WW
01-Core-13B

Use the diagram of the weather instrument below to answer the following three questions.

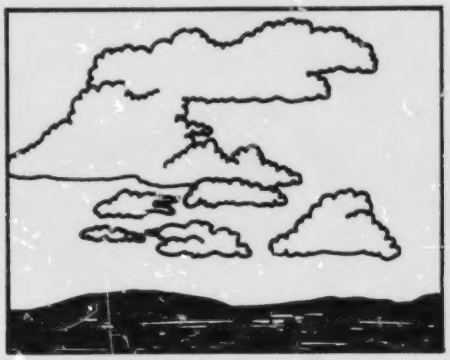


1. What is the wind speed?
2. What is the wind direction?
3. How much precipitation has there been since the last reading?

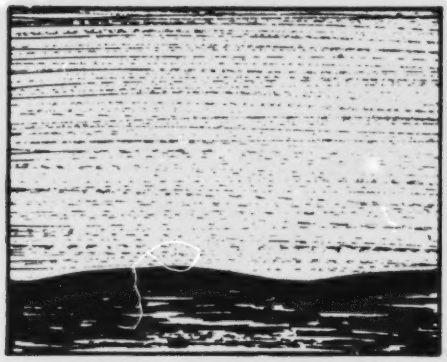
Name the cloud type shown in each diagram below.

WW
01-Core-14B

Cloud type 1.



Cloud type 2.



Cloud type 3.

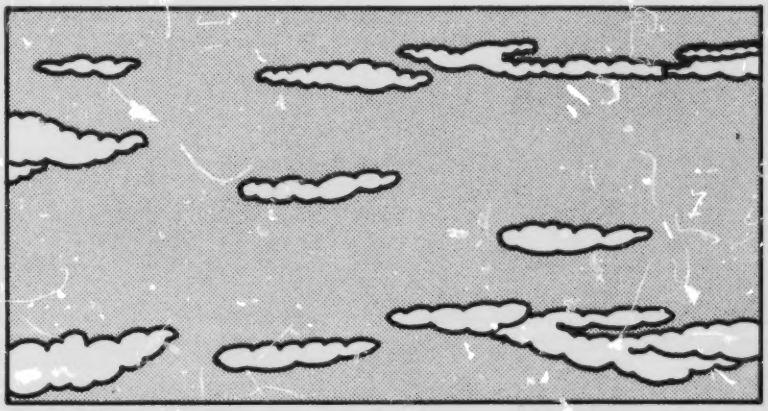
Draw the symbols that are used to represent the following amounts of cloud cover.

1. 75% overcast
2. Clear sky (0% overcast)

WW
01-Core-15B

WW
01-Core-16B

Draw the cloud-cover symbol which represents the amount of cloud cover on the day the following diagram was drawn.



WW
01-Core-17B

Symbols like °C for *degrees Celsius*, % for *percent*, = for *equals* are often used in science. Why do scientists use symbols?

WW
01-Core-18B

Mary Ellen measured the depth of snowfall to be 32 inches in an area where there was no drifting. How many inches of rainfall is approximately equivalent to a 32-inch snowfall?

WW
01-Core-19B

Your teacher will observe you for this check when he can.

WW
01-Core-20B

Your teacher will observe you for this check when he can.

WW
01-Core-21B

Your teacher will observe you for this check when he can.

WW
01-Core-22B

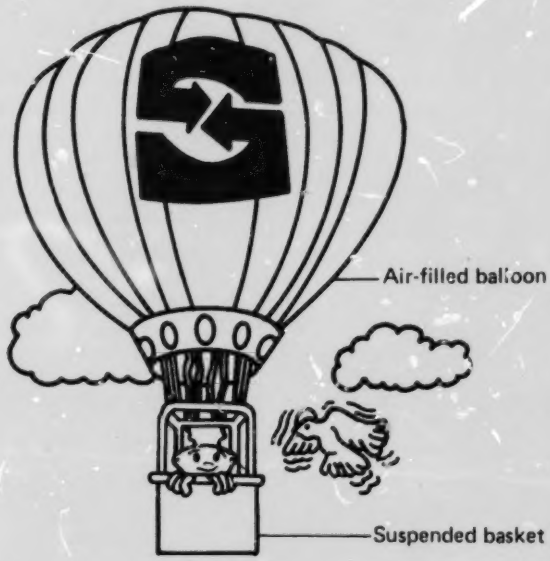
Your teacher will observe you for this check when he can.

WW
01-Core-23B

Your teacher will observe you for this check when he can.

You are suspended in a basket from a balloon, as shown below. Suddenly the balloon begins to descend before your flight is completed. Which of the objects listed below would be the best possible help to you?

WW
01-Exc 1-1-1B



a. An air pump to blow up the balloon
b. A valve to let some air out of the balloon
c. A butane burner to heat the air in the balloon
d. A device to cool the air in the balloon

Tara has just filled a balloon with hot air.

1. Will this balloon have more lifting force if the air around it is warm or if it is cold?
2. Explain your answer.

WW
01-Exc 1-1-2B

Design a plan you could use to measure the relationship between the lifting force of a hot-air balloon and the temperature of the air inside the balloon.

WW
01-Exc 1-1-3B

In the diagram below, arrows show the way the wind is blowing across the coast.

WW
01-Exc 2-1-1B

Which of the following best names the wind direction?

a. W wind
b. NE wind
c. SE wind
d. SW wind
e. S wind

WW
01-Exc 2-1-2B

As Kitty was trying to take a wind direction reading, the pointer on the wind-direction instrument kept moving from NW through W to SW and back to NW again. She should

a. record N.
b. record W.
c. record all three directions – NW, W, and SW.
d. wait until the wind direction is steadier before taking a reading.
e. record S.

WW
01-Exc 2-1-3B

Mike made the following observations concerning wind speed on a weekend when he didn't have a wind-measuring instrument available. Arrange the observations in order of increasing wind speed. List the number of the lowest wind speed first.

1. The clothes on the line hang limp.
2. Bushes begin to move.
3. The branches of a large tree sway.
4. A pile of loose paper begins to blow around.

WW
01-Exc 2-2-1B

What does the prefix *alto* mean when it is added to the name of a type of cloud?

WW
01-Exc 2-2-2B

Get pictures 2, 4, and 6 from folder WW-01-Exc 2-2-2. Name the type of cloud shown in each picture.

WW
01-Exc 2-3-1B

Use the following table to convert the two temperatures listed below it.

°C	°F	°C	°F	°C	°F	°C	°F
20	68.0	10	50.0	0	32.0	-10	14.0
19	66.2	9	48.2	-1	30.2	-11	12.2
18	64.4	8	46.4	-2	28.4	-12	10.4
17	62.6	7	44.6	-3	26.6	-13	8.6
16	60.8	6	42.8	-4	24.8	-14	6.8
15	59.0	5	41.0	-5	23.0	-15	5.0
14	57.2	4	39.2	-6	21.2	-16	3.2
13	55.4	3	37.4	-7	19.4	-17	1.4
12	53.6	2	35.6	-8	17.6	-18	-0.4
11	51.8	1	33.8	-9	15.8	-19	-2.2

1. How many °F equal -5°C?
2. How many °C equal 39°F?

Convert the following wind speeds from miles per hour to kilometers per hour. (HINT: There are 1.6 kilometers in 1 mile.)

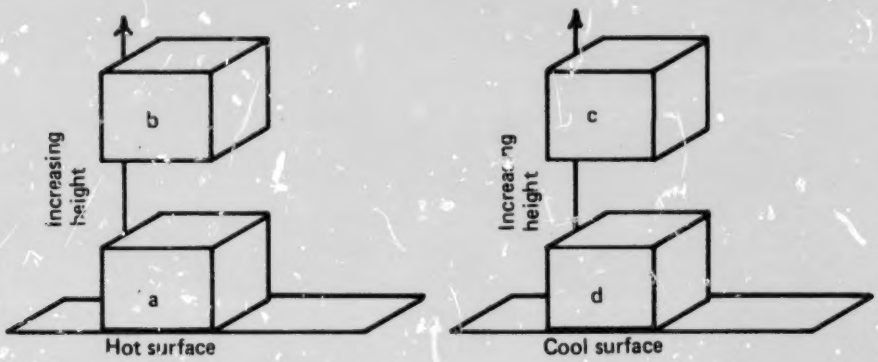
WW
01-Exc 2-3-2B

1. 18 mph
2. 56 mph

Suppose that according to your rain gauge 2.5 inches of rain fell last night. There are 2.54 cm in one inch. How many centimeters of rain fell last night?

WW
01-Exc 2-3-3B

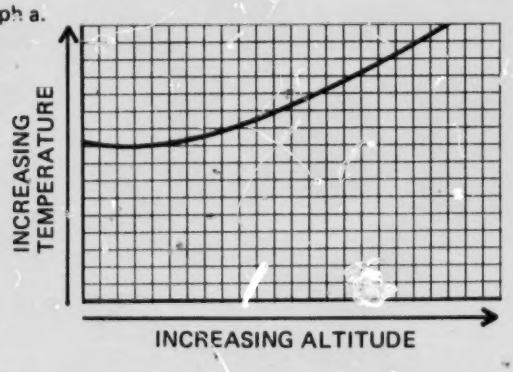
Examine the following diagram which shows cubes of air over two different surfaces. **WW 02-Core-1B**



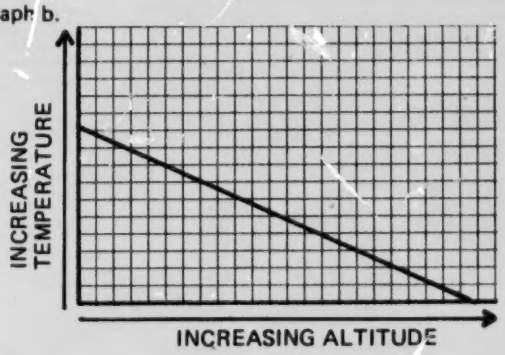
1. Which cube of air will be the coolest?
2. Which cube of air will be the hottest?

Which of the graphs below best shows how air temperature usually changes with altitude above the earth's surface? **WW 02-Core-2B**

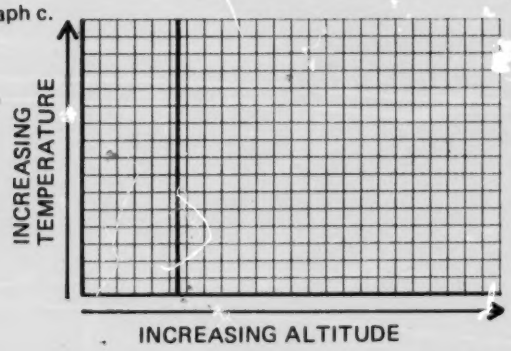
Graph a.



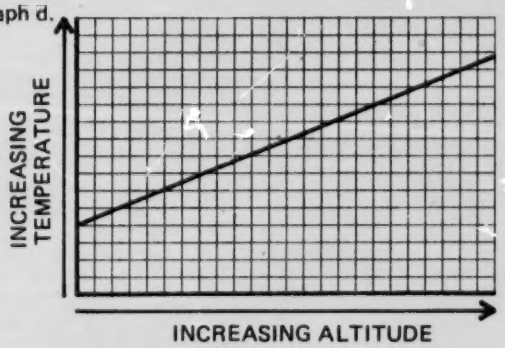
Graph b.



Graph c.



Graph d.



Air pressure is a force exerted on objects at the earth's surface. What causes air pressure? **WW 02-Core-3B**

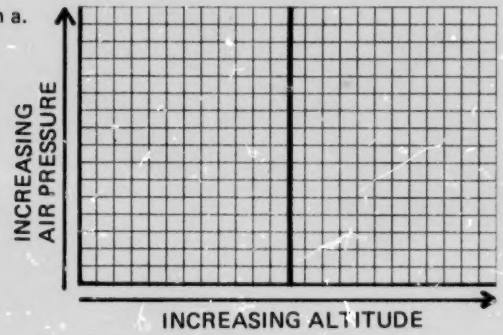
WW 02-Core-4B

Weathermen usually measure air pressure in terms of the height of a column of mercury. What is air pressure that causes it to support a column of mercury?

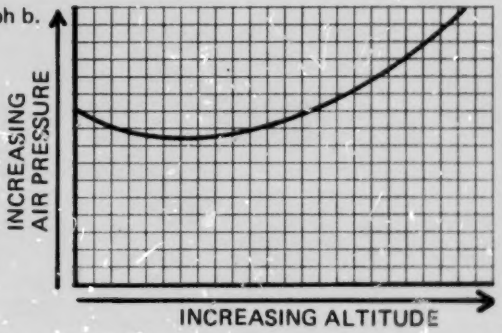
WW 02-Core-5B

Which of the graphs below best shows how air pressure usually changes with altitude above the earth's surface?

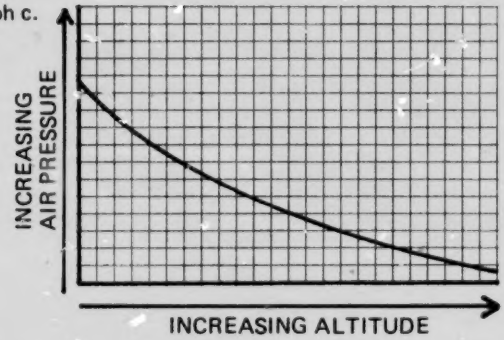
Graph a.



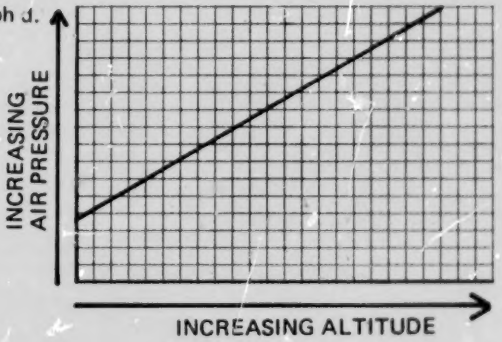
Graph b.



Graph c.



Graph d.



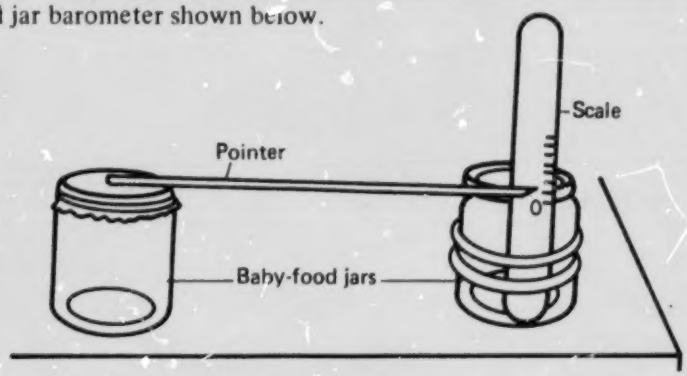
WW 02-Core-6B

Air pressure measured by a barometer at the top of a high cliff is less than air pressure measured at sea level because

a. at higher altitudes, air particles move more slowly.
b. there is less air above the air at the top of the cliff than there is above the air at sea level.
c. there are fewer air particles at higher altitudes.
d. the air is cooler at higher altitudes.

Mary built the baby-food jar barometer shown below.

WW
02-Core-7B



1. If Mary took this barometer up in a helicopter, would the pointer move up on the scale or down on the scale as the helicopter's altitude increased? (Assume that the temperature remained constant.)
2. Explain your answer

Each jar shown below is capped with the end of a rubber balloon. Match the best description of the relationship between the pressure inside the jar and the pressure outside the jar with each of the diagrams. Write the number of the diagram and after it the letter of the matching description.

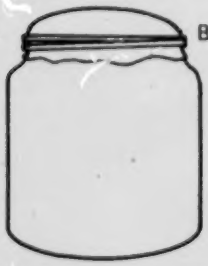
WW
02-Core-8B

Diagram

1. Dished in

2. Flat

3. Bulged out

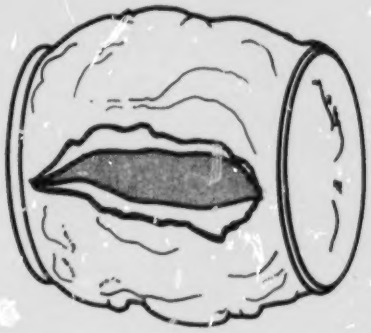


Description

a. Pressure inside equal to pressure outside
b. Pressure inside less than pressure outside
c. Pressure outside less than pressure inside
d. None of these

WW
02-Core-9B

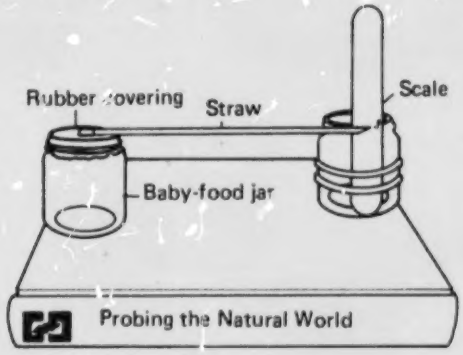
Bob drew the diagram shown below of a tin can that had been damaged because there was too much pressure difference between the air inside and outside the can.



1. Was the air pressure outside greater or less than the air pressure inside?
2. What evidence do you have to support your decision?

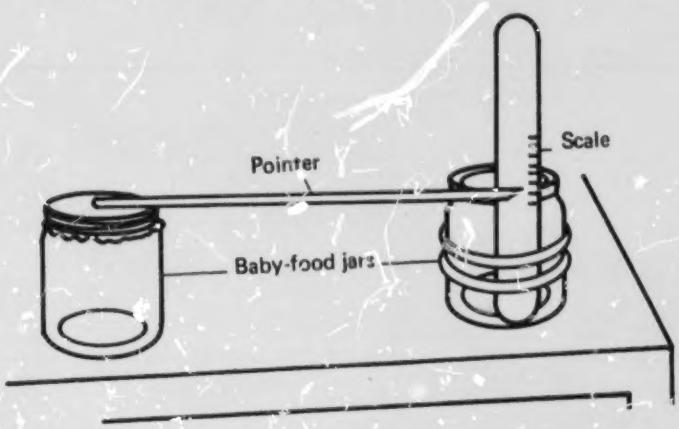
WW
02-Core-10B

In Chapter 3, a straw was attached to the rubber covering of the baby-food jar barometer, as shown below. Explain why it is a good idea to do this.



Sue built the baby-food jar barometer shown below and set it up outside. She read the barometer on a cool day. She read the barometer the next afternoon when it was very hot outside. The reading was the same as it had been the day before.

WW
02-Core-11B



1. Had the air pressure outside increased, decreased, or stayed the same?
2. Explain your answer.

You have seen water collect on the outside of a glass of cold water. Betty thinks that this happens because water passes through the sides of the glass. State a procedure by which you could show Betty that the moisture doesn't come from the inside of the glass.

WW
02-Core-12B

What does the term *dew point* mean?

WW
02-Core-13B

Define the term *relative humidity*.

WW
02-Core-14B

Ask your teacher to watch you do this check. Get the sling psychrometer. Measure the relative humidity in your classroom. You may use Table 4-2 on page 44 of *Winds and Weather*.

WW
02-Core-15B

Use the information given below to determine the relative humidity.

Temperature = 20°C

Greatest amount of water vapor which can be held in 1000 ml of air at 20°C = 20 milligrams

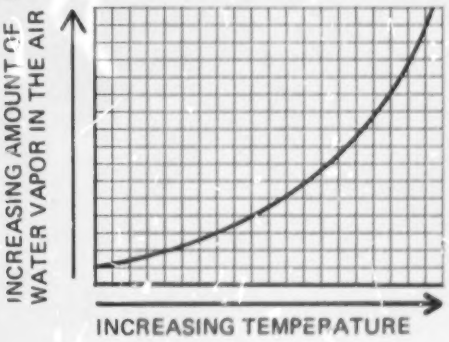
Actual amount of water vapor in this 1000 ml of air = 17 milligrams

WW
02-Core-16B

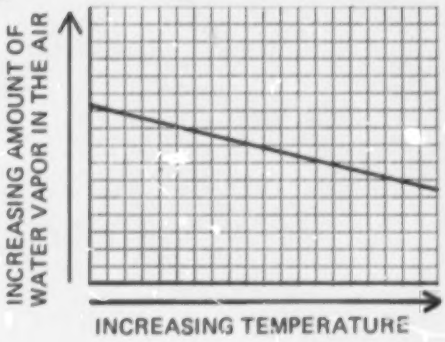
WW
02-Core-17B

Which graph below best shows how the greatest amount of water vapor that the air can hold varies with temperature?

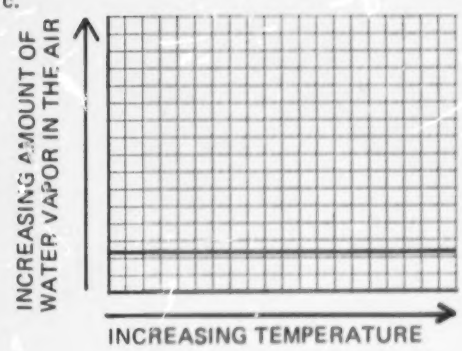
Graph a.



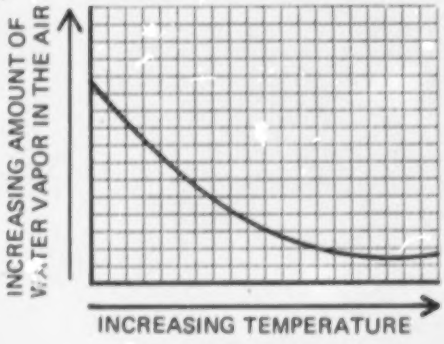
Graph b.



Graph c.



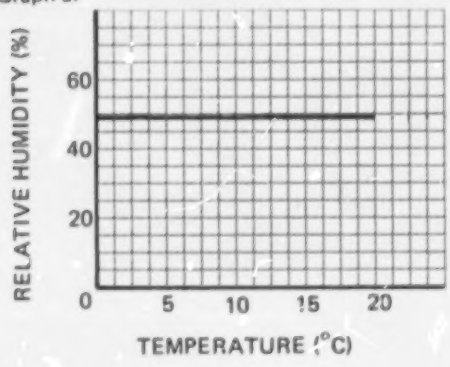
Graph d.



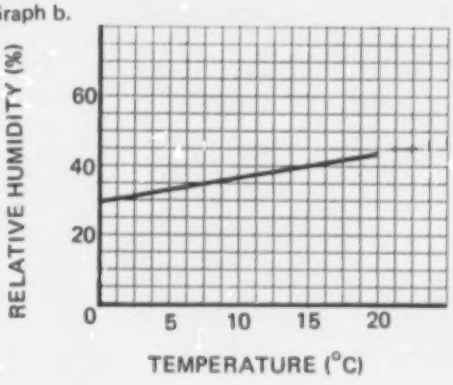
Eustace heated a sample of air so that the temperature increased but the amount of water vapor in the air stayed the same. Which graph below best illustrates how the relative humidity would change with temperature?

WW
02-Core-18B

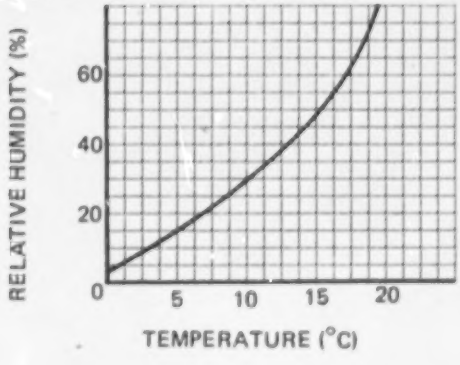
Graph a.



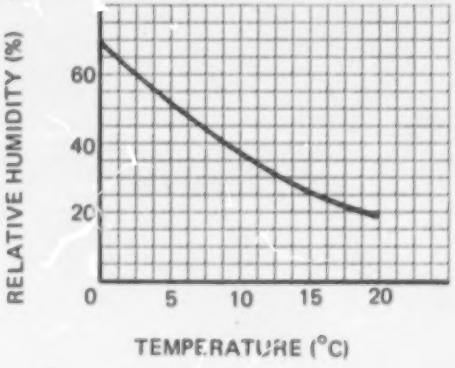
Graph b.



Graph c.



Graph d.



Sue measured the wet-bulb and dry-bulb temperatures on Wednesday and found the difference was 5°.

WW
02-Core-19B

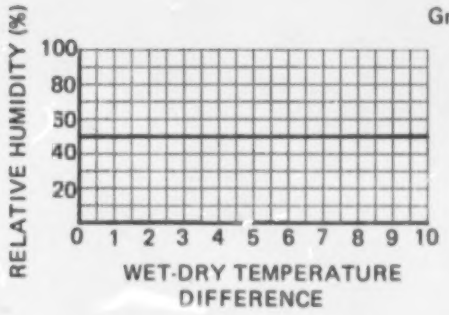
On Thursday, Ann measured them and found the difference to be 2°.

1. On which of the two days was the relative humidity higher?
2. Explain your answer.

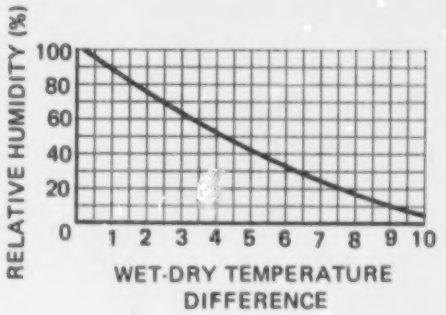
WW
02-Core-20B

For ten days in a row, Merrie's dry-bulb reading of her sling psychrometer was unchanged. Yet, each day her wet-bulb reading changed, giving her a greater difference between the two temperatures. She made a graph showing both the daily relative humidity and the difference between her wet-bulb and dry-bulb temperature readings. Select the letter of the graph below that best shows the relationship she found.

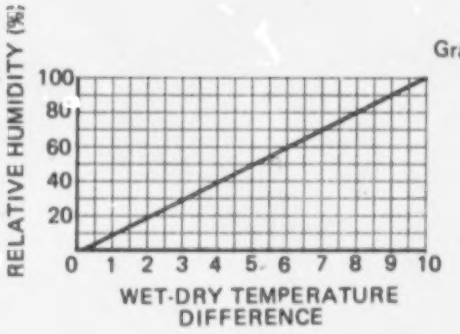
Graph a.



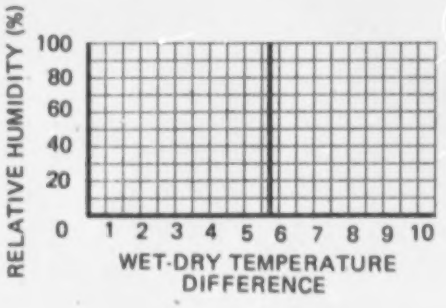
Graph b.



Graph c.



Graph d.



WW
02-Core-21B

Ask your teacher to watch you do this check. Get the sling psychrometer. Measure the dew point in your classroom. You may use Table 4-3 on page 46 of *Winds and Weather*.

WW
02-Core-22B

There must be solid particles in the air in order for clouds to form. Why?

WW
02-Exc 3-1-1B

Record the letters of all of the following that could be measures of pressure.

a. 3.2 pounds
b. 5 newtons per square centimeter
c. 28 newtons
d. 51 pounds per square foot
e. 1 newton per square meter
f. 10 inches

Tim weighs 810 newtons. When he stands on a block of wood, his weight is distributed over about 30 square cm of the surface of the wooden block. What pressure does he exert on the block's surface? (Be sure to express your answer in the proper units.)

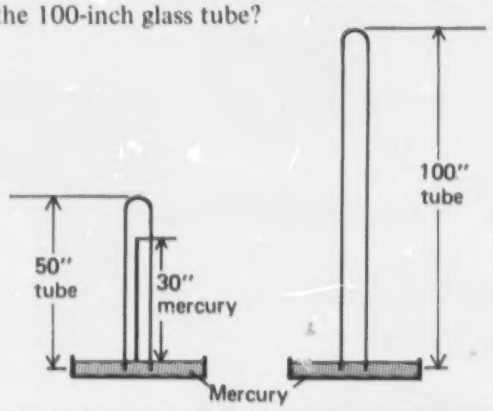
WW
02-Exc 3-1-2B

Which exerts more pressure, the weight of a 90-pound ballerina exerted on the 2 square inches of her toe or the weight of a 200-pound man exerted on the 9 square inches of the flat heel on his shoe?

WW
02-Exc 3-1-3B

Betty made a mercury barometer from a glass tube 50 inches long. She made another mercury barometer 100 inches long from tubing of the same diameter. Then she measured the height of the mercury column in each tube. She found that the height of the mercury column in the 50-inch tube was 30 inches. Which answer best indicates the height of the mercury column in the 100-inch glass tube?

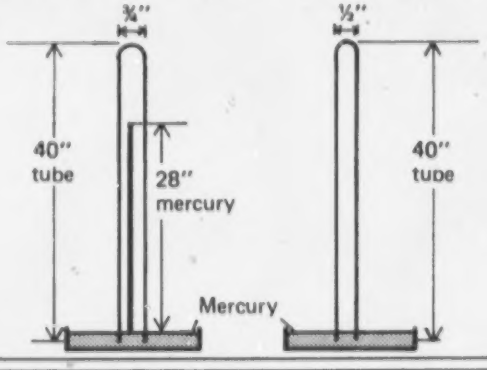
a. 60 inches
b. 15 inches
c. 100 inches
d. 30 inches
e. 50 inches



WW
02-Exc 3-2-1B

Look at the diagram below. Ann used a glass tube with a diameter of ¾ inch and a length of 40 inches to make a mercury barometer. The mercury column in this tube today is 28 inches high. Which answer best indicates how high the mercury column would be today in a barometer tube with a diameter of ½ inch and a length of 40 inches?

a. 42 inches
b. 28 inches
c. 14 inches
d. 7 inches
e. 50 inches



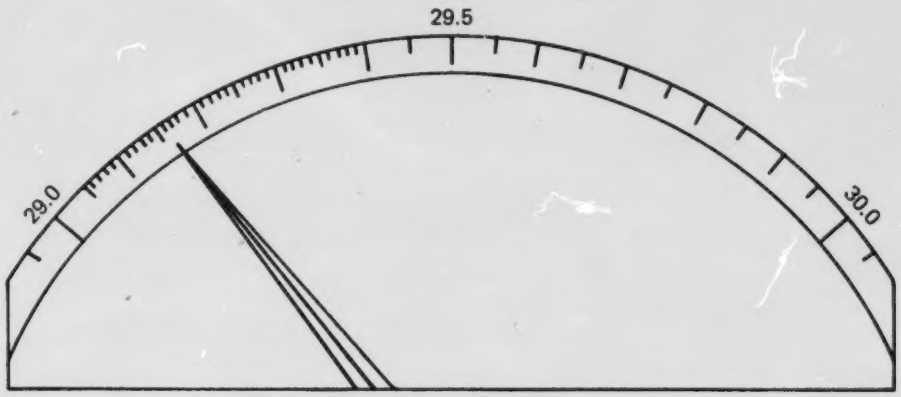
WW
02-Exc 3-2-2B

One millibar of pressure is equal to 0.0145 pounds per square inch of pressure. An air pressure of 1016 millibars is required to support a mercury column 30 inches high. What air pressure, in pounds per square inch, is required to support a column of mercury 21 inches high?

WW
02-Exc 3-2-3B

WW
02-Exc 3-2-4B

What is the barometric pressure shown below?



WW
02-Exc 4-1-1B

Peter had two wet-bulb thermometers. He wet the wick of one with alcohol and the wick of the other with water. He waved both thermometers around for 20 seconds.

1. Which thermometer will register the lower temperature after being waved?
2. Explain your answer.

WW
02-Exc 4-1-2B

Lucille had two identical dry-bulb thermometers. She placed one on the table and waved the other one around quickly for 15 seconds.

1. Which thermometer would have registered the lower temperature?
2. Explain your answer.

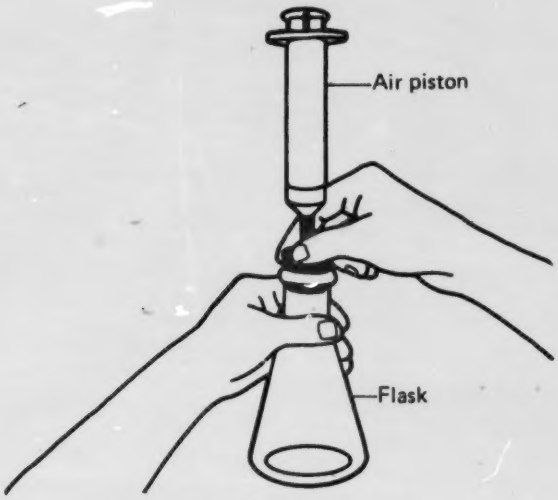
WW
02-Exc 4-1-3B

Jack wet the wicks of two wet-bulb thermometers with water. He kept one thermometer stationary and waved the other one around for 15 seconds.

1. Which thermometer registered the lower temperature?
2. Explain your answer.

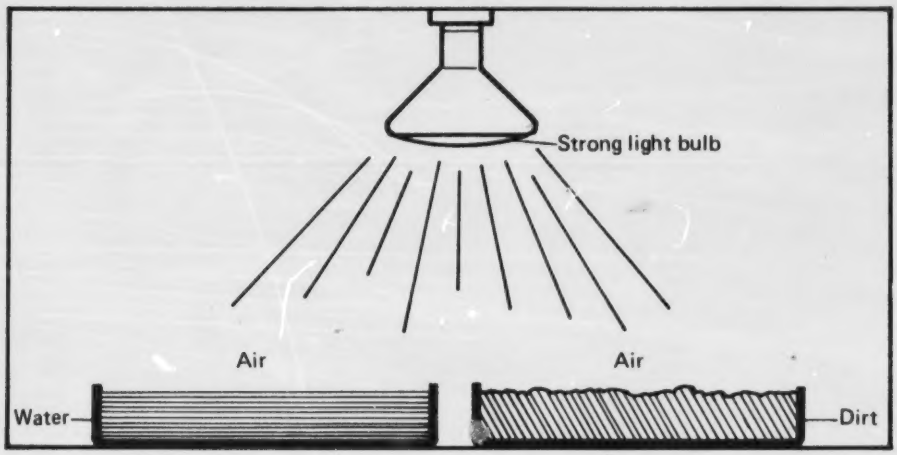
Sam, using the setup shown in the diagram, formed a mist in the flask without any difficulty. A month later, Joan tried the same activity and had great difficulty. Before she could get any mist at all to form, she had to cool the flask with cold water. Why might Joan have had trouble forming a mist when Sam did not?

WW
03-Core-1B



In the setup shown below, Pete left the light on for 5 minutes. He then measured the temperature of the air 2 cm above the surface of the dirt and of the air 2 cm above the surface of the water.

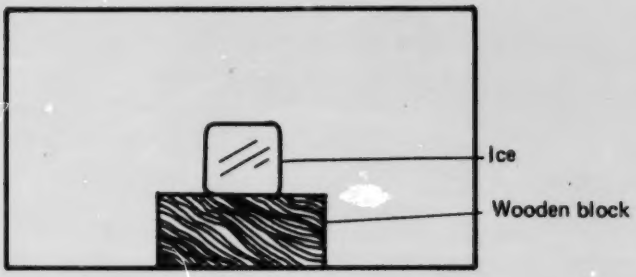
WW
03-Core-2B



1. Is the air warmer above the water or above the dirt?
2. Explain your answer.

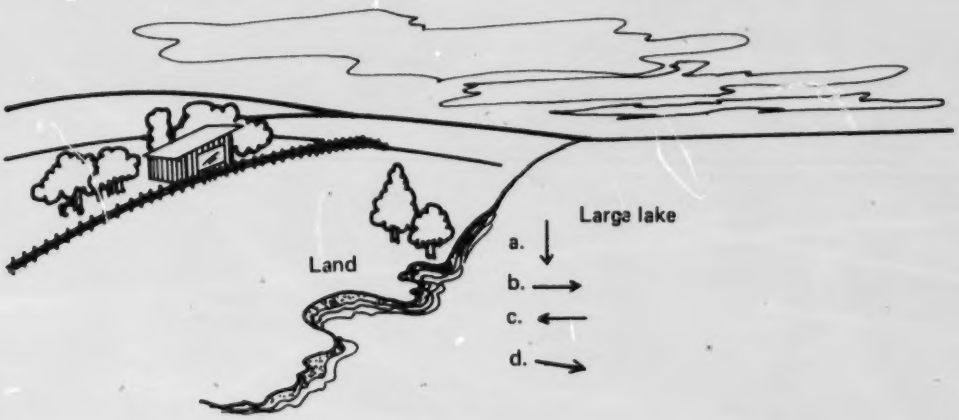
WW
03-Core-3B

Steve placed a piece of ice on a wooden block in an observation box as shown in the diagram below. Copy this diagram onto your answer sheet, or get a copy of it from your teacher. Draw arrows on your copy to show the direction of air movement throughout the entire box.



WW
03-Core-4B

The diagram below shows a summer cottage located by a very large lake. Select the arrow that best indicates the wind direction on a hot, sunny day.



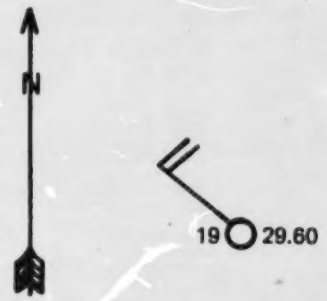
WW
03-Core-5B

At the seashore last summer, Bill noticed that each day there was a cool breeze blowing in from the ocean. Which statement below explains the reason for this cool breeze?

a. There is less air over the ocean than over the land.
b. The air over the ocean is warmer than the air over the shore.
c. The waves of the ocean cause the air to be blown over the land.
d. The air over land is usually warmer, and the cooler ocean air moves in over the land and causes this warmer air to rise.
e. The air over the land contains more water vapor than the air over the ocean.

WW
03-Core-6B

WIND SPEED (in mph)	WIND SPEED SYMBOL
Less than 1	
1-3	
4-7	
8-12	
13-18	
19-24	
25-31	



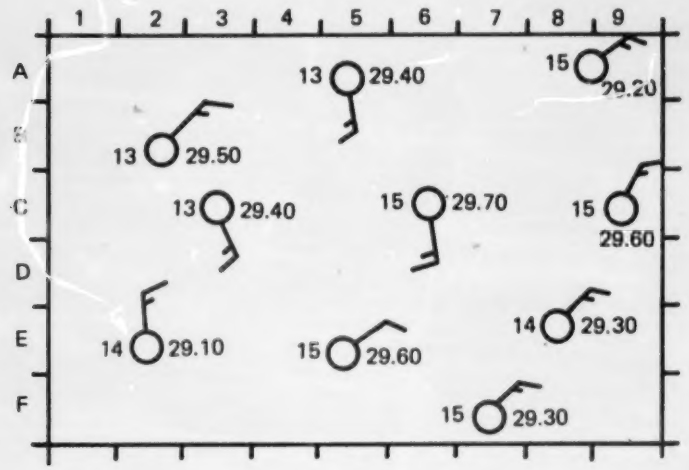
Use the information above to help interpret the weather map symbol shown next to the arrow. Then answer the four questions about the symbol.

1. What is the wind direction?
2. What is the wind speed?
3. What is the temperature?
4. What is the air pressure?

WW
03-Core-7B

Use the horizontal and vertical scales on the weather map shown below to answer the two questions.

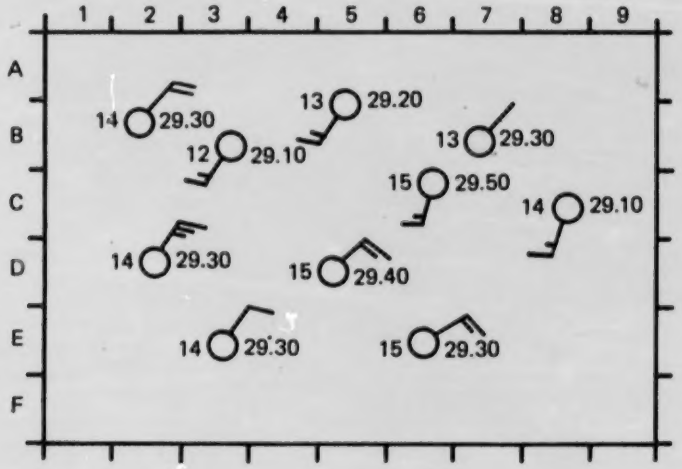
1. Which weather station reported the highest air pressure?
2. Which weather station reported the lowest air pressure?



WW
03-Core-8B

Use the horizontal and vertical scales on the weather map shown below to answer the two questions.

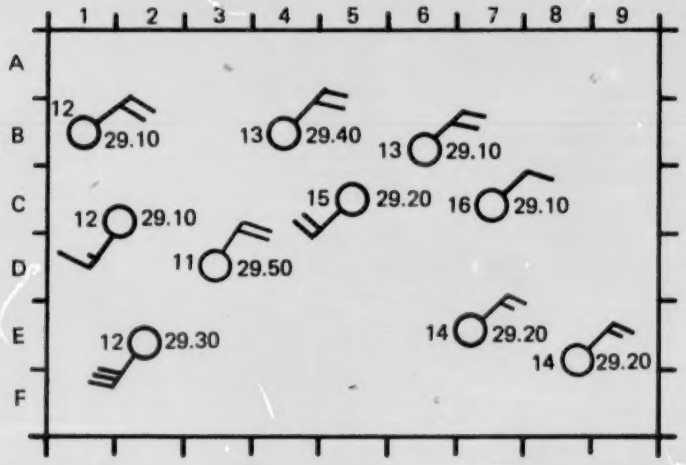
1. Which weather station reported the highest wind speed?
2. Which weather station reported the lowest wind speed?



WW
03-Core-9B

Use the horizontal and vertical scales on the weather map shown below to answer the two questions.

1. Which weather station reported the highest temperature?
2. Which weather station reported the lowest temperature?

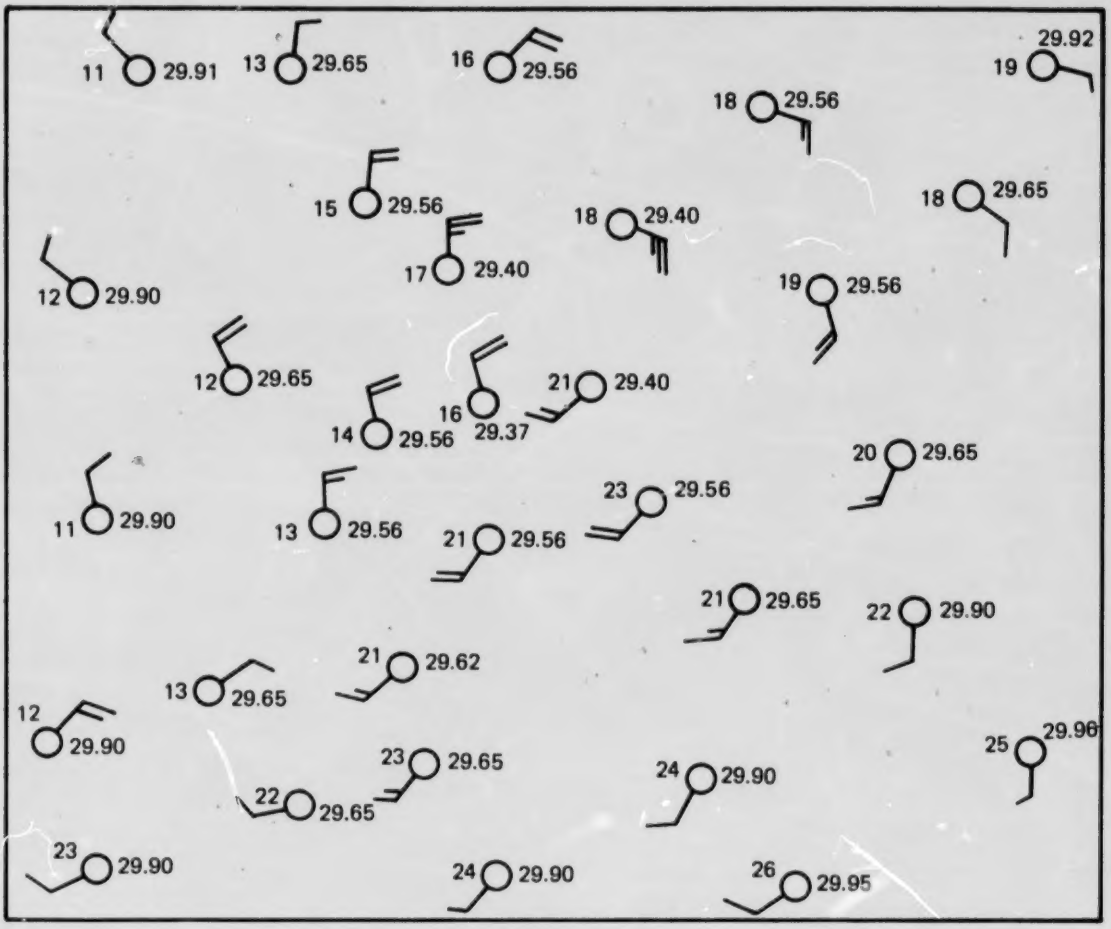


Isobars are used by weather forecasters in predicting weather trends. What is an isobar?

WW
03-Core-10B

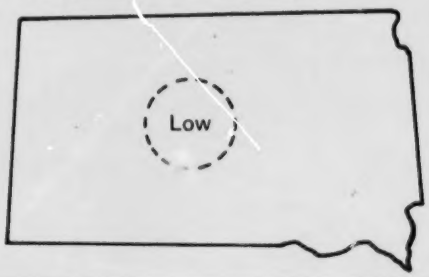
Get a copy of the weather map shown below from your teacher. Draw in two isobars on your copy of the weather map.

WW
03-Core-11B



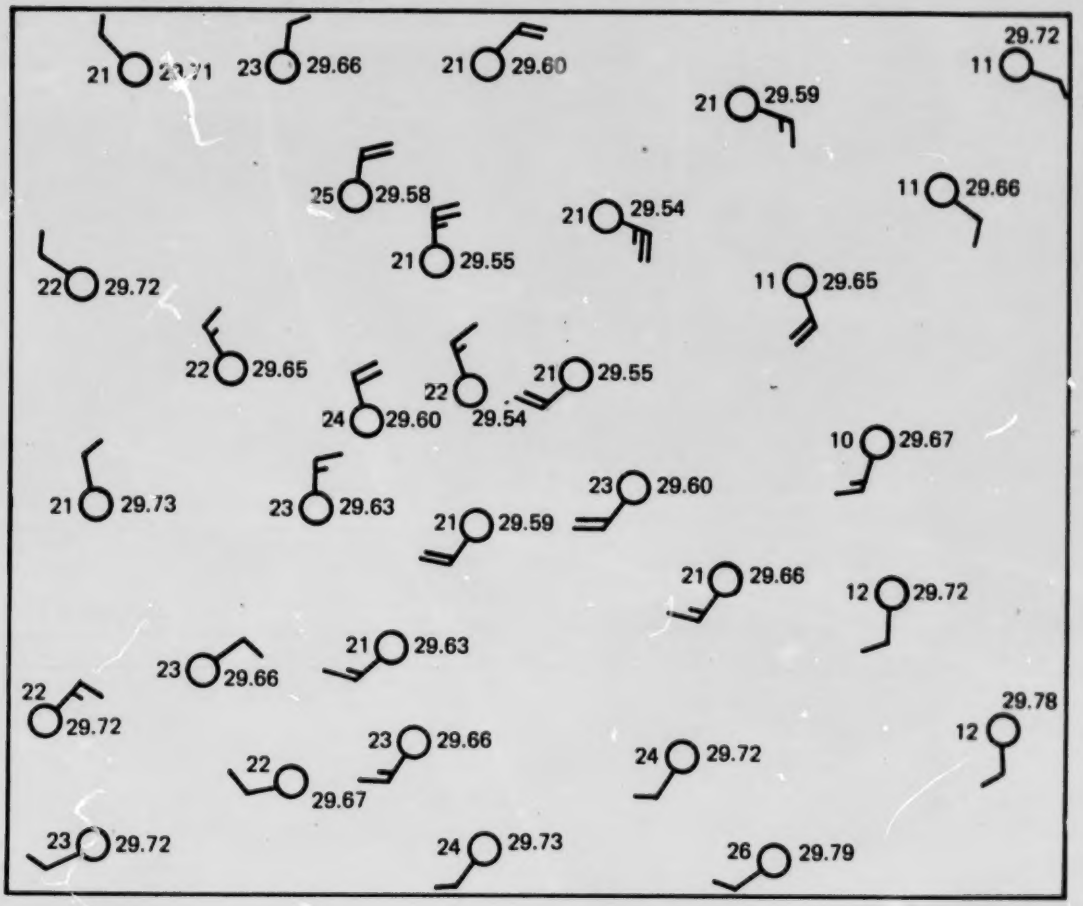
Copy the map of the state of South Dakota shown below. The map shows a low pressure area near the middle of the state. Use arrows to indicate the directions of the wind over the state when the low pressure area is present.

WW
03-Core-12B



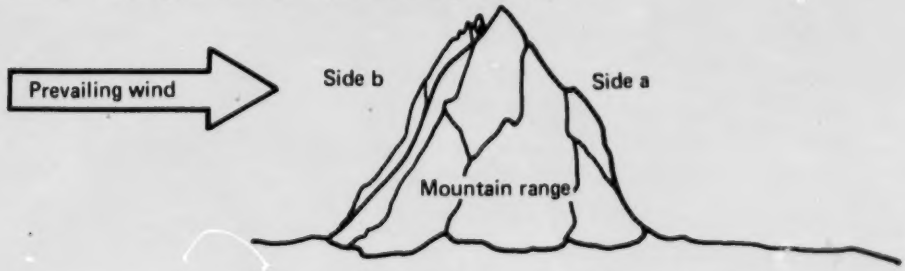
WW
03-Core-13B

Ask your teacher for a copy of the weather map shown below. Use the information on the map to determine the areas where you would expect to find overcast skies. Shade in those overcast areas on your copy of the weather map.



WW
03-Core-14B

Examine the diagram of the mountain range below.



1. Which side of the mountain range, a or b, will receive more rainfall?
2. Explain your answer.

What are three major causes of the uplifting of air?

WW
03-Core-15B

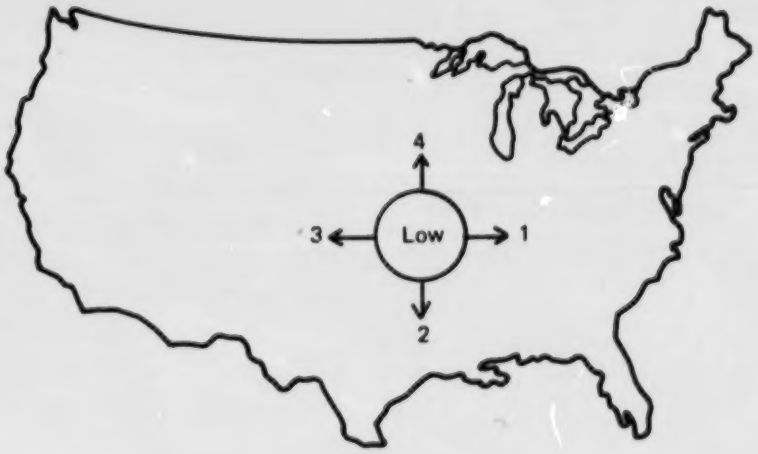
Name each of the weather map symbols below.

WW
03-Core-16B

From the list below, select the option that shows the direction in which the low pressure area shown on the map is most likely to move.

WW
03-Core-17B

a. Arrow 1
b. Arrow 2
c. Arrow 3
d. Arrow 4
e. All of the directions indicated are equally likely.



WW
03-Core-18B

The weather map below shows a low pressure area approaching Indianapolis, Indiana.

List the letters of all the changes in the weather you would expect as the low pressure area approaches.

a. The barometric pressure will rise.
b. The wind will shift until it is blowing from the southwest.
c. The temperature will remain constant or rise.
d. The sky will cloud over.
e. The temperature will suddenly drop.

The weather map below shows a cold front approaching New Orleans, Louisiana.

WW
03-Core-19B

Which of the weather changes would you expect to occur as the cold front approaches and passes through?

a. The temperature will drop as the cold front passes through.
b. Stratus clouds in the sky will warn of the approaching cold front.
c. The barometric pressure will tend to drop as the cold front approaches and then rise as the cold front passes through.
d. The wind will shift so that it blows from the north as the cold front passes through.
e. The temperature will drop as the cold front approaches.

WW
03-Core-20B

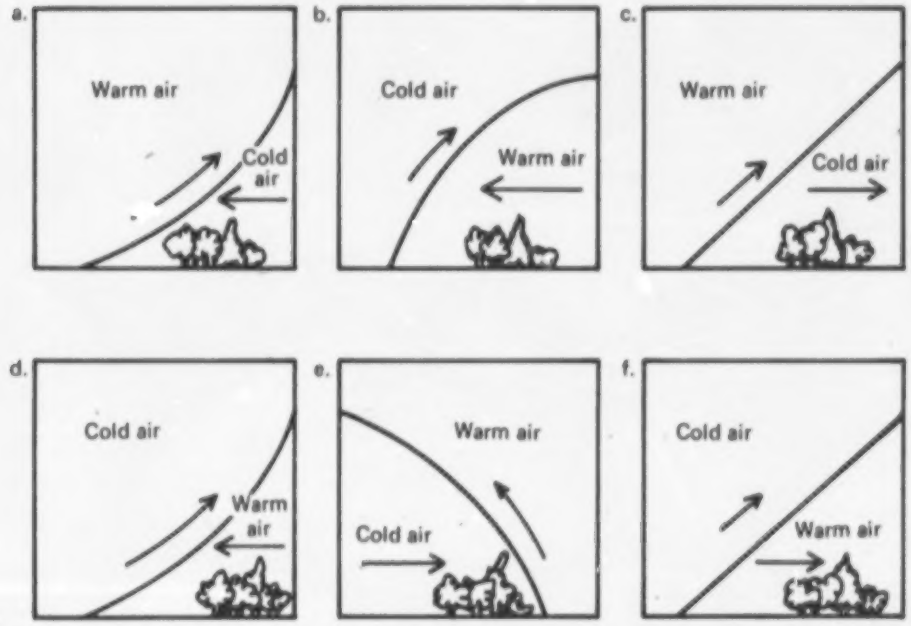
The weather map below shows a warm front approaching Gulfport, Mississippi.

List the letters of all the weather changes you would expect to occur as the warm front approaches and passes through.

a. The barometric pressure will rise steadily as the warm front approaches and passes through.
b. There will be a south wind as the warm front approaches.
c. The temperature will increase as the warm front passes through.
d. Cirrus clouds will appear in the sky first, followed by cumulus, and then by stratus as the warm front gets closer.
e. There will be a north wind as the warm front passes through.

The arrows in the diagrams below represent the directions of air movement. **WW 03-Core-21B**

1. Which diagram best represents a warm front?
2. Which diagram best represents a cold front?



Jack measured the air temperature at the earth's surface. It was 25.2°C. He knows that the air temperature decreases at an average rate of about 1.0°C per 100 m. What was the air temperature at an altitude of 860 meters above the surface of the earth at the time Jack made his measurement? **WW 03-Exc 5-1-1B**

Andy wants to determine the dew point at an altitude of 1890 meters above the earth's surface. He has measured the dew point at the earth's surface. It is 13.1°C. He knows that the dew point of air decreases at an average rate of 1.0°C per 550 m. What is the dew point at an altitude of 1890 m at the time Andy took his measurement? **WW 03-Exc 5-1-2B**

On August 9, Robert made the following measurements. **WW 03-Exc 5-1-3B**

Temperature, using dry-bulb thermometer = 28°C
Temperature, using wet-bulb thermometer = 26°C

He used these measurements to find that the relative humidity was 85% and the dew point was 26°C. The height of cloud bottoms can be obtained using the following formula:

$$\text{Height of cloud bottom in meters} = 122\ (T_{air} - T_{dew\ point})$$

Use Robert's information to calculate the height of the cloud bottoms on August 9.

WW
03-Exc 5-2-1B

In order to use a nephoscope to measure the speed of clouds, which of the following measurements must you make?

a. The height of your eye above the nephoscope
b. The height of a cloud
c. The time required for the cloud to travel from the center to the edge of the nephoscope circle
d. The radius of the nephoscope circle
e. Only the measurements listed in a, b, and d
f. All of the measurements listed in a, b, c, and d

WW
03-Exc 5-2-2B

Use the measurements and the formulas below to calculate the speed (S) of the clouds.

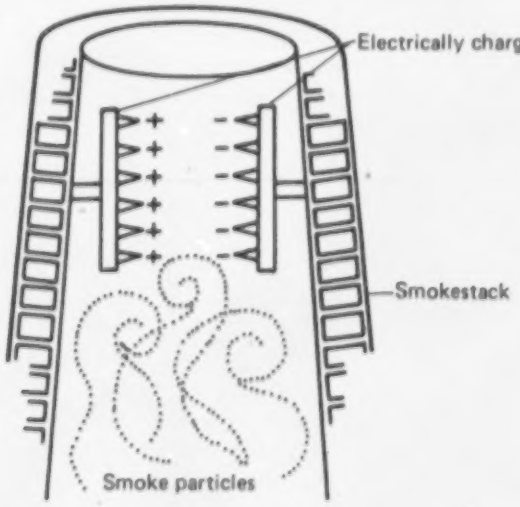
$$D = \frac{H \times d}{h} \qquad \text{and} \qquad S = \frac{D}{t}$$

d (radius of nephoscope circle) = 0.04 meters
h (height of eye above nephoscope) = 0.5 meters
H (estimated height of cloud) = 2200 meters
t (time for cloud to move from center to edge of the nephoscope circle) = 7 seconds

---

WW
03-Exc 7-1-1B

A factory has just installed in its smokestacks the new device shown below. What effect will these large, electrically charged racks have on the smoke particles? Select the letter of the best possible answer from the list below.



a. Cause small particles to clump together
b. Keep rain from entering the stack
c. Get the smoke out of the stack faster
d. Remove the color from the smoke
e. Stop all gases from going up the stack

For a number of years scientists have been trying to make rain when they want it. One method they have used is to drop millions of tiny crystals of dry ice into a cloud from an airplane. Dry ice crystals are very cold, about -73°C. Explain how dropping dry ice into a cloud can cause rain.

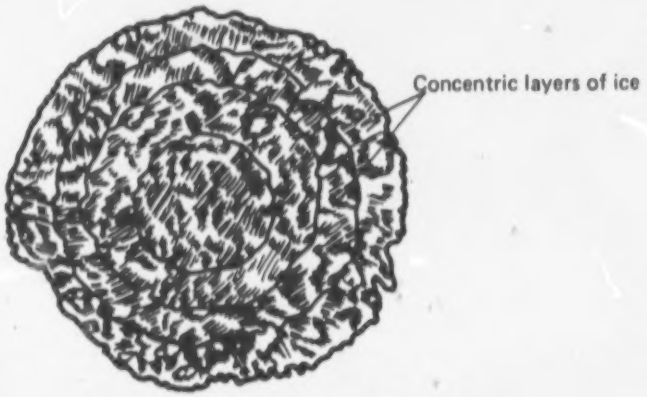
WW
03-Exc 7-1-2B

While watching a cumulus cloud one day, Steve noticed that it did not last long. Why do cumulus clouds often fade away quickly?

WW
03-Exc 7-2-1B

Hailstones usually consist of concentric layers of ice as shown below. Why is this so?

WW
03-Exc 7-2-2B



The table below shows the measurements that Eudora has made during the last four days. Open *Winds and Weather* to page 165.

WW
03-Exc 7-3-1B

DATE	TIME	TEMP. (in °C)	WIND DIR.	WIND SPEED (in mph)	CLOUD TYPE	CLOUD COVER	PRECIPI-TATION (in inches)	BAR. PRESS. (in inches)	REL. HUM. (in %)	DEW POINT (in °C)
21	2:00	20	E	8-12	stratus	◑	--	29.80	50	19
22	2:20	15	NE	8-12	cumulus	◕	--	29.85	80	17
23	3:00	10	N	14-24	cumulonimbus	●	2.5	29.90	100	8
24	2:45	5	N	13-18	cumulus	◑	--	29.90	30	4

Based on Eudora's data and on Table 2 on page 165, answer the following questions to tell what changes will probably occur in the next 24 hours.

1. Will the temperature increase, decrease, or stay constant?
2. Will the relative humidity increase, decrease, or stay constant?
3. Will the sky become cloudier, clearer, or stay the same?
4. Will there be any clouds? If so, name the type.
5. Will there be no, some, or heavy precipitation?
6. Will there be no wind, a light breeze, or a strong wind?

Crusty Problems

CP

A very important idea used in studying changes in the continents on the earth was first stated by Alfred Wegener. What was it?

CP
01-Core-1B

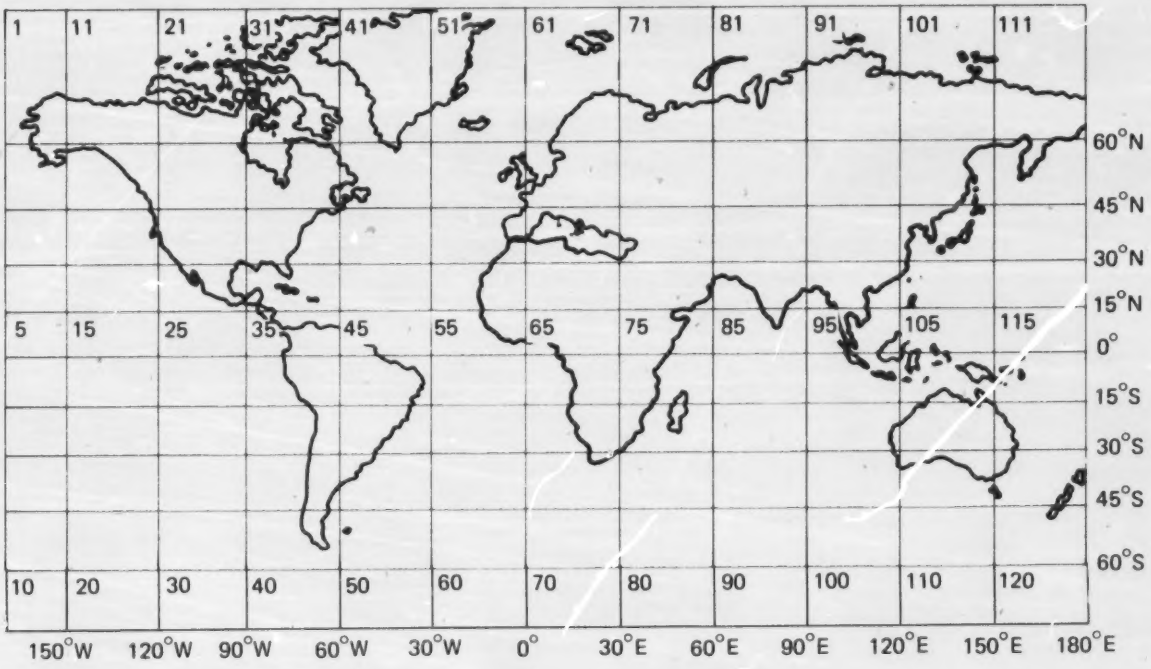
If continents were once joined and have since separated, there should be some evidence of that. What evidence supports that idea?

CP
01-Core-2B

The data below are from the "Preliminary Determination of Epicenters" table. For each of the four earthquakes, use the map below to determine its location. Write the number of the earthquake and after it the number of the box in which the earthquake is located. Note that the boxes on the map are numbered in order from top to bottom. (For example, box 86, though unnumbered, is the box directly below box 85.)

CP
01-Core-3B

EARTHQUAKE	ORIGIN TIME (GMT)			GEOGRAPHIC COORDINATES		DEPTH (in km)
	Hr	Min	Sec	Lat	Long	
1	05	16	56.2	6.8 S	147.7 E	45
2	05	40	12.7	48.3 N	135.4 W	10
3	16	10	55.4	20.0 S	166.6 E	590
4	16	27	47.7	23.5 S	113.1 E	36



CP
01-Core-4 B

The diagrams below show the motions of four plates.

Diagram A

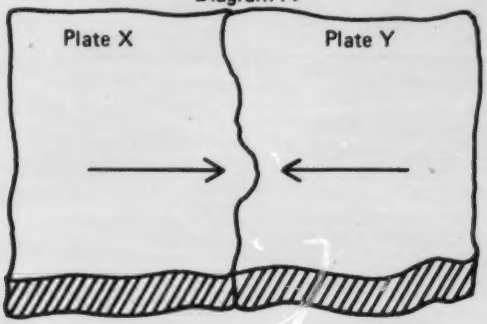
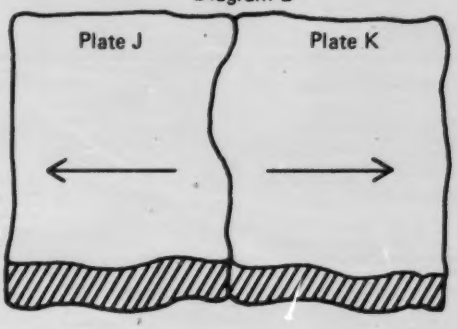


Diagram B



1. Which of the following describe the line between the plates in Diagram A?
   a. It is probably in the middle of an ocean.
   b. It is probably near the edge of a continent.
   c. It is the source of shallow earthquakes.
   d. It is the source of deep earthquakes.
   e. It is the source of no earthquakes.
   f. The line is between colliding plates.
   g. The line is between separating plates.
2. Which of the following describe the line between the plates in Diagram B?
   a. It is probably in the middle of an ocean.
   b. It is probably near the edge of a continent.
   c. It is the source of shallow earthquakes.
   d. It is the source of deep earthquakes.
   e. It is the source of no earthquakes.
   f. The line is between colliding plates.
   g. The line is between separating plates.

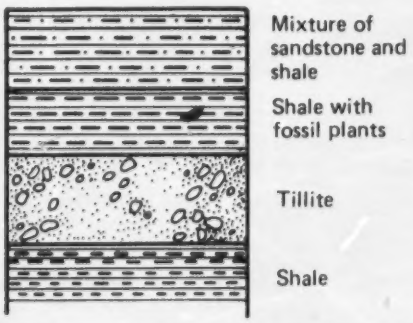
Study the diagram below.

CP
01-Core-5B

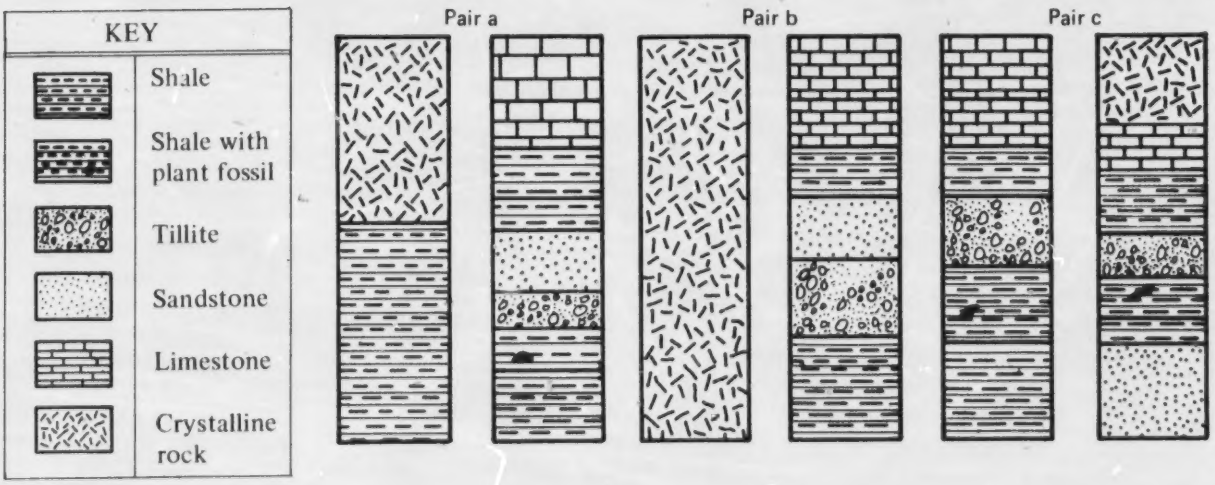
1. Is there any evidence in the diagram that geologic change has occurred?
2. If there is, list the processes that caused the change.

Suppose that a 19th century geologist in the Southern Hemisphere found on at least three different continents deposits of rock whose layers were in the sequence shown in the diagram below. Each rock deposit included a layer which contained the same kind of fossil plant. Assume you are a geologist and want to find an explanation for this. List two questions whose answers would help you get more information.

CP
01-Core-6B



CP **01-Core-7B**	Your teacher will observe you for this check when he can.
CP **01-Core-8B**	Your teacher will observe you for this check when he can.
CP **01-Core-9B**	Your teacher will observe you for this check when he can.
CP **01-Core-10B**	Your teacher will observe you for this check when he can.
CP **01-Core-11B**	Your teacher will observe you for this check when he can.
CP **01-Res 1-1B**	State evidence from the Ice Age that geologists use to support their theory of continental drift.
CP **01-Res 2-1B**	Study the rock sequence pairs below. Each pair contains rocks from two continents separated by an ocean. 1. Which pair is evidence that the continents were once joined? 2. What evidence supports your answer?



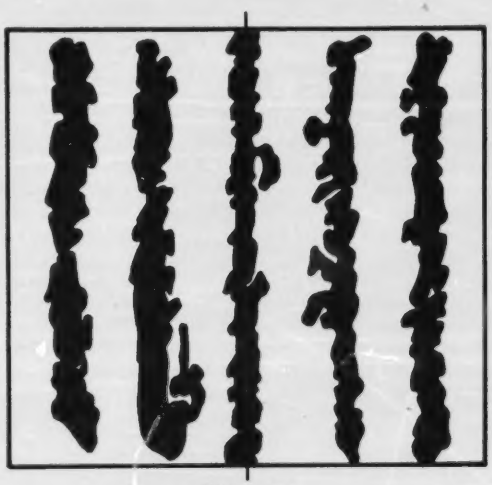
Sometimes a baked apple is used as a model to explain mountain building on the earth. In what ways are they similar so that the apple can explain mountain building?

CP 01-Res 3-1B

The diagram below shows the magnetic field recorded in the rocks in an ocean basin. The shaded areas represent rocks on the sea floor that record the earth's magnetic field as it is today. The white areas indicate rocks with a reversed magnetic field. The ridge axis is shown at the center of the diagram.

CP 01-Res 4-1B

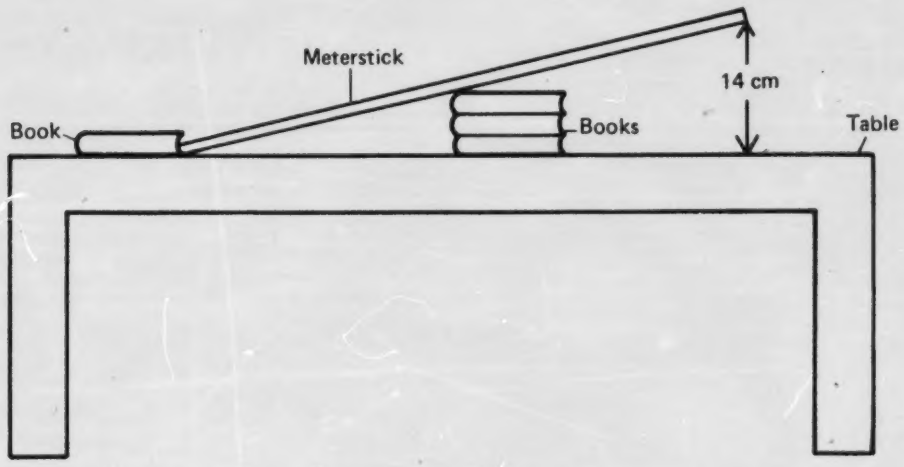
Below are four statements. Some of them are observations, and some are not. List the letter of each statement which is directly observable in the diagram.



a. The sea floor is spreading away from the ridge.
b. The ridge axis appears to bisect the magnetic lines.
c. Four reversals are recorded in the rocks shown in the diagram.
d. The rocks farther from the ridge are older than those near it.

Get a meterstick, and put several books under one end of it to make the distance between the table and the stick 14 cm at the high end. Keep the other end of the meterstick steady with a book, as shown in the diagram below. Get a clinometer, and measure the dip angle of the meterstick.

CP 02-Core-1B



The five statements listed below refer to cutout block CP-02-Core-2. Get the block from your teacher. The key for the block is given below.

CP 02-Core-2B

KEY	
Symbol	Rock
	sandstone
	shale
	conglom-erate
	shale-sand-stone

On your answer sheet, write the number of each statement, and after it indicate whether it is an observation or an interpretation. Then, after each statement you labeled as an interpretation, state the observation on which that interpretation is based.

1. The rocks were uplifted and tilted after formation.
2. The rocks are tilted approximately 30°.
3. The conglomerate layers were formed during a time when conditions changed.
4. The sandstone layer is the youngest.
5. There are four rock layers in the section.

CP 02-Core-3B

Get rock E from the CP Rock Check Kit and a hand lens.

1. State whether the texture of this rock is interlocking or noninterlocking.
2. Give your reason for your answer.

CP 02-Core-4B

Get rock J from the CP Rock Check Kit and a hand lens.

1. State whether the rock has interlocking or noninterlocking texture.
2. Give the reason for your decision.

CP 02-Core-5B

Get rock H from the CP Rock Check Kit and a hand lens and a steel nail. Open your textbook to Table 1 on page 47.

1. Is this rock sample igneous, sedimentary, or metamorphic?
2. For what reason did you decide on that type of rock?

CP 02-Core-6B

Which of the characteristics below are important in describing a rock's texture?

a. Oriented grains
b. Cement visible
c. Noninterlocking grains
d. Spaces between the grains
e. All of these
f. None of these

CP 02-Core-7B

Get igneous rock sample M from the CP Rock Check Kit. Study it carefully.

1. Describe the conditions under which it formed.
2. Where in or on the earth's crust do those conditions exist?

CP 02-Core-8B

Select the letter of the mountain type which has the characteristics of a faulted mountain.

MOUNTAIN TYPE	LOCATION	CHIEF ROCK TYPE	SHAPE
a.	isolated on plains	deep-cooled igneous or metamorphic	round, dome-shaped
b.	valley and ridge regions	marine sediments, may be metamorphic	groups of long, symmetrical, parallel slopes
c.	scarp and basin regions	marine sediments, may be metamorphic	long and wedge-shaped
d.	earthquake and geyser zones	surface-cooled igneous	round, cone-shaped

Get rock samples E, H, J, and L from the CP Rock Check Kit. Below is a list of environments in which the samples may have formed. Write the letter of the rock sample after the number of the environment in which you think it was formed.

CP
02-Core-9B

Environments

1. From the flow of volcanic material
2. In a pool of molten rock deep within the crust
3. In an ocean basin
4. In solid rock of the crust, under pressure at or near the surface of the earth

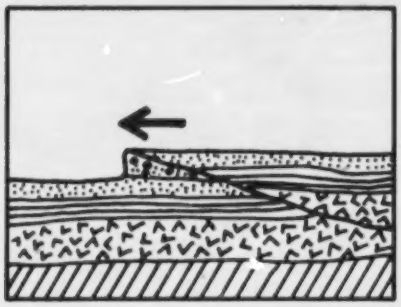
---

Compare the diagrams below and the photograph of Death Valley in Figure 2-7 on page 36.

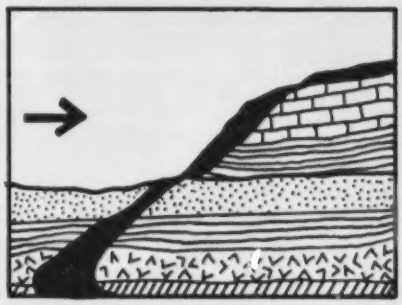
CP
02-Core-10B

1. Which diagram shows the probable formation of Death Valley?
2. Give two pieces of evidence for your choice.

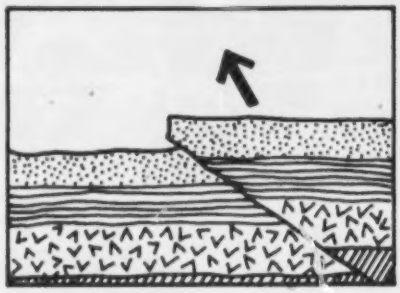
a.



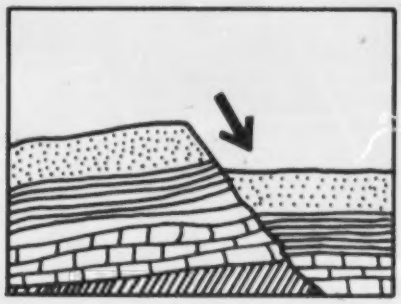
b.



c.



d.



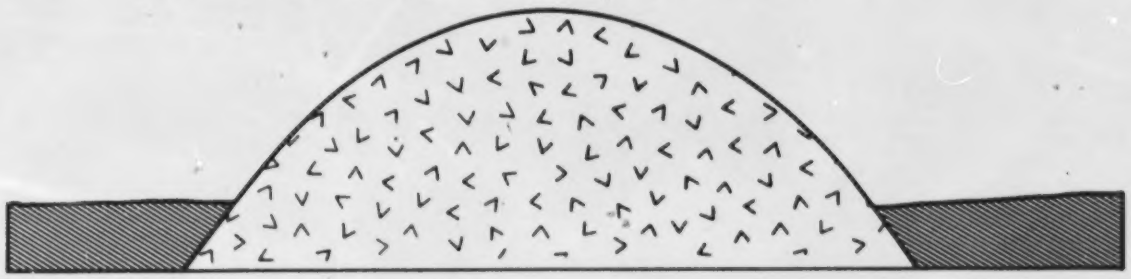
CP
02-Core-11B

Write the letter of the mountain type which has the characteristics of an erosional mountain. Erosional mountains form when softer surrounding materials erode away.

MOUNTAIN TYPE	LOCATION	CHIEF ROCK TYPE	SHAPE
a.	isolated on plains	deep-cooled igneous or metamorphic	round, dome-shaped
b.	earthquake and geyser zones	surface-cooled igneous	round, cone-shaped
c.	scarp and basin regions	marine sediments, may be metamorphic	long and wedge-shaped
d.	valley and ridge regions	marine sediments, may be metamorphic	groups of long, symmetric, parallel slopes

CP
02-Core-12B

Get rock G from the CP Rock Check Kit. The diagram below shows a cross section of a mountain. If a mountain has the shape shown below and is made entirely of the same rock as the sample, how was the mountain formed?



CP
02-Core-13B

In the table below, four types of mountains are described. Write the letter of the mountain type which has the characteristics of folded mountains.

MOUNTAIN TYPE	LOCATION	CHIEF ROCK TYPE	SHAPE
a.	isolated on plains	deep-cooled igneous or metamorphic	round, dome-shaped
b.	earthquake and geyser zones	surface-cooled igneous	round, cone-shaped
c.	valley and ridge regions	marine sediments, may be metamorphic	groups of long, symmetric, parallel slopes
d.	scarp and basin regions	marine sediments, may be metamorphic	long and wedge-shaped

Write the letter of the mountain type which has the characteristics of an old volcanic crater.

CP
02-Core-14B

MOUNTAIN TYPE	LOCATION	CHIEF ROCK TYPE	SHAPE
a.	earthquake and geyser zones	surface-cooled igneous	round, cone-shaped
b.	isolated on plains	deep-cooled igneous or metamorphic	round, dome-shaped
c.	valley and ridge regions	marine sediments, may be metamorphic	groups of long, symmetric, parallel slopes
d.	scarp and basin regions	marine sediments, may be metamorphic	long and wedge-shaped

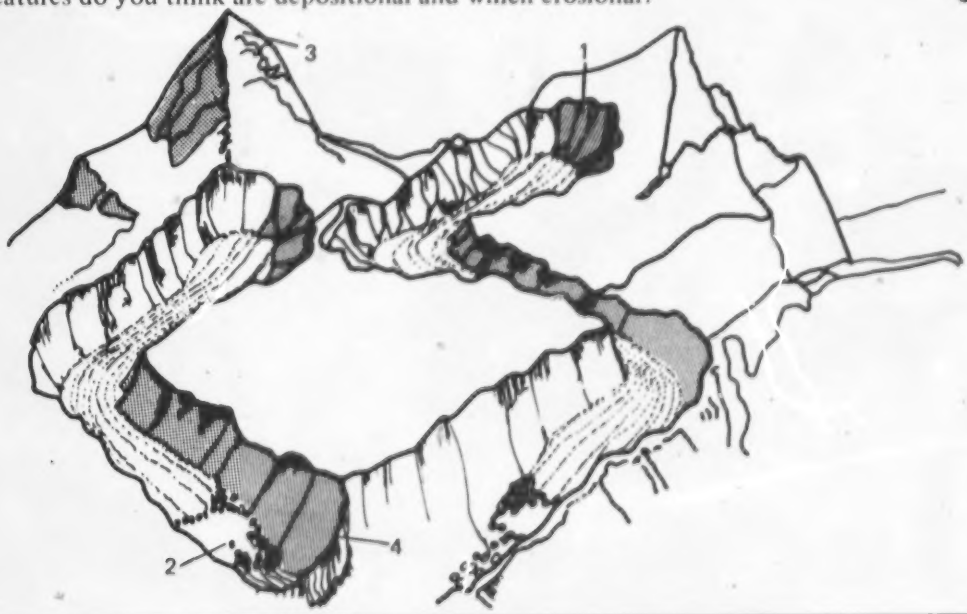
Write the letters of any erosional features listed below which were formed by glacial action.

CP
02-Core-15B

a. Undercutting
b. Cirque
c. Sill
d. U-shape valley
e. Hanging valley

Examine the diagram below. Four features have been indicated by numbers. Which of these features do you think are depositional and which erosional?

CP
02-Core-16B



CP 02-Core-17B

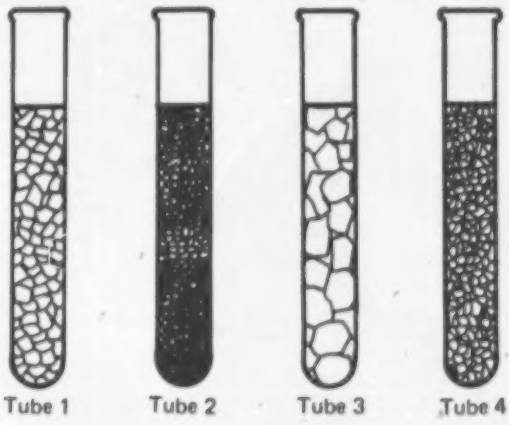
Get cutout block CP-02-Core-17 from your teacher. It represents layers of sedimentary rock. What caused them to become so deformed?

CP 02-Res 5-1B

Get rock samples H, O, and P from the CP Rock Check Kit. Also get a hand lens, a steel nail, and dilute HCl. Open your textbook to the rock test key on pages 45 through 47. Write the letter of each sample, and state if it is igneous, sedimentary, or metamorphic.

CP 02-Res 6-1B

The four test tubes shown below contain the same substance which was cooled from a liquid to a solid at different rates. On your answer sheet, list the numbers of the test tubes in the order of the rate from slowest to fastest at which the substance in each was cooled.



CP 02-Res 6-2B

Get a hand lens and, from the CP Rock Check Kit, samples H, L, and M. These are three igneous rocks. Each one cooled and solidified from a molten material. Observe each rock carefully with the hand lens.

1. Using the letter on each, list the rocks in the order that you think they cooled, from fastest cooling to slowest cooling.
2. How did you decide the order?

CP 02-Res 7-1B

Examine the photograph that your teacher has labeled CP-02-Res 7-1B. How was the layer that the arrow points to formed?

CP 02-Res 7-2B

Monica added a small amount of dilute HCl to a rock sample. Bubbles immediately appeared on the rock.

1. Name the rock that reacts with acid in this way.
2. What is the rock made of?

Frank found a rock near his home. He observed that it was composed of one kind of material, and the grains were noninterlocking. He concluded it was sedimentary. Using his "Mineral Classification Chart," he determined that the single visible component was garnet. He then applied HCl to the rock, and it began to bubble. Since garnet does not react with HCl, what would cause the HCl to bubble?

CP
02-Res 8-1B

Get cups CP-02-Res 8-2a and CP-02-Res 8-2b. Examine the sand in both cups.

1. What difference do you notice in these two samples?
2. Explain how this difference could occur in nature.

CP
02-Res 8-2B

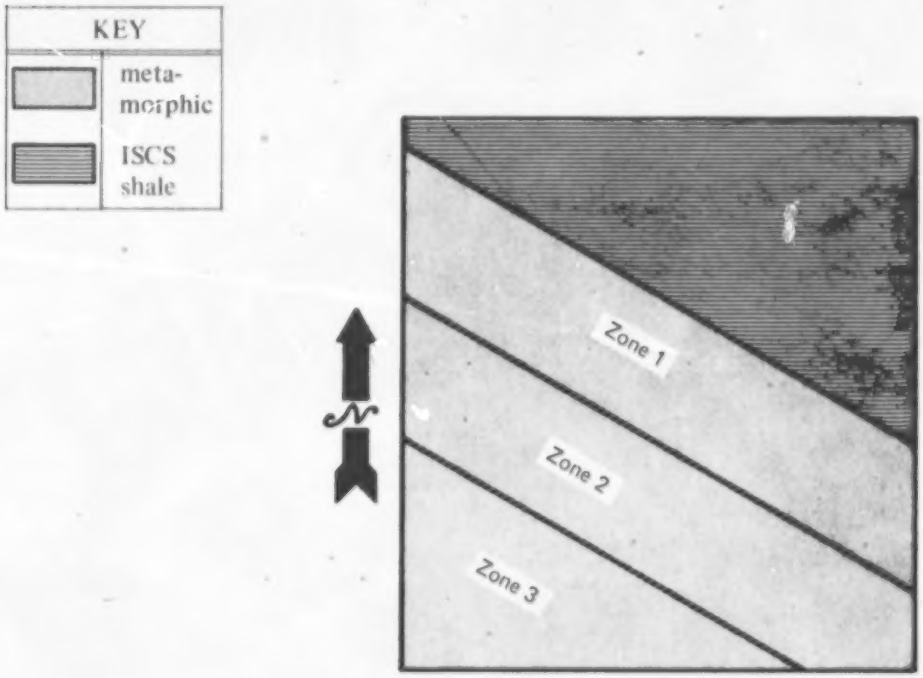
From the CP Rock Check Kit take samples K and J. Also get a hand lens and some dilute HCl.

1. Determine whether each is a sandstone, a shale, or a limestone.
2. Explain how you know.

CP
02-Res 9-1B

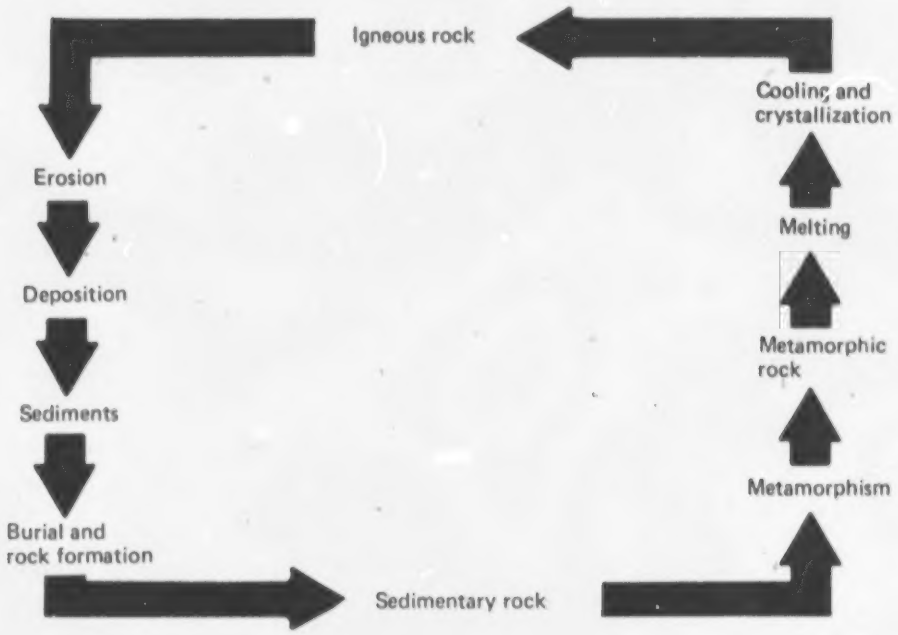
Get rock samples E, F, and N from the CP Rock Check Kit. The map below shows where ISCS shale and metamorphic rocks are found. Assume that the intensity of metamorphism is greatest in the southwest part of the map.

CP
02-Res 10-1B

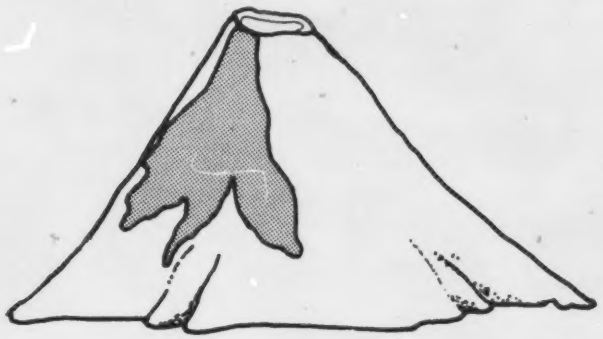


1. In which zones would you most likely find each of the three rock samples you have been given?
2. Explain your answer.

CP 02-Res 11-1B	Suppose you had two minerals to compare. How could you determine (define) their relative hardness?
CP 02-Res 11-2B	Get minerals d, l, and n from the CP Mineral Check Kit. Write the letter of each mineral, and after it state the kind of luster – metallic or nonmetallic – that it has.
CP 02-Res 11-3B	Get mineral samples g, f, and l from the CP Mineral Check Kit. Examine them carefully. 1. Write the letter of each mineral sample that shows cleavage. 2. Explain how you know.
CP 02-Res 11-4B	Get minerals b, e, and m from the CP Mineral Check Kit and a glass plate and knife. Open your textbook to the "Mineral Classification Chart" on pages 68 and 69. Identify each mineral by writing its letter and name on your answer sheet.
CP 02-Res 12-1B	The diagram below shows a rock cycle. In this case, the sedimentary rock becomes metamorphic rock and then is melted. Using arrows and the labels from the diagram, draw on your answer sheet another path for a sedimentary rock in the cycle.



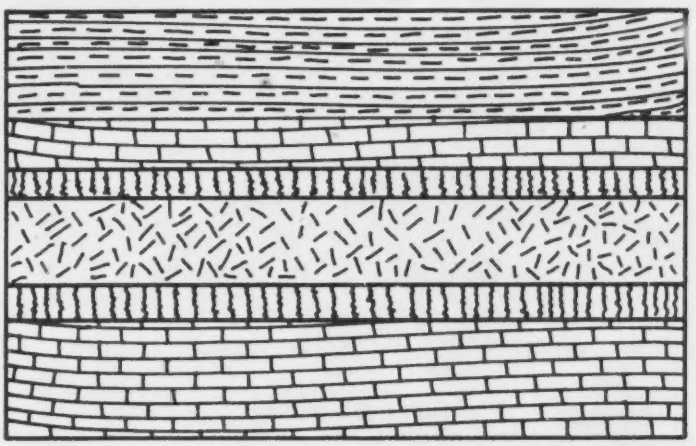
1. How was the mountain shown in the diagram below formed? **CP**
2. What evidence supports your answer? **02-Res 13-1B**



Study the diagram below carefully. **CP**

1. Is the igneous rock an intrusion (intruded rock) or a flow? **02-Res 14-1B**
2. How do you know?

KEY	
Symbol	Rock Type
	sedimentary type 1
	sedimentary type 2
	igneous
	metamor-phic



CP
02-Res 15-1B

Both of the igneous rocks shown in the diagrams below are intrusions.

1. Which is a sill?
2. Which is a dike?
3. Explain your answers.

KEY	
Symbol	Rock
	igneous
	shale

Diagram A.

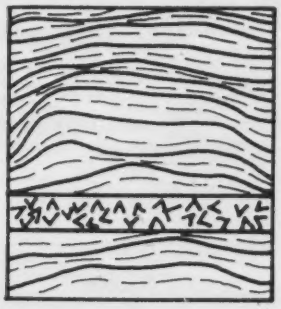


Diagram B.

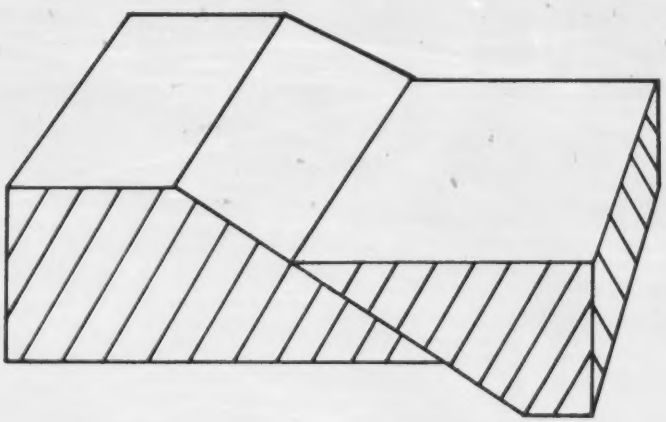
CP
02-Res 16-1B

Much of the lava found in the northwestern United States did not flow from volcanoes. Instead it flowed from long cracks in the earth's surface. What are these cracks called?

CP
02-Res 17-1B

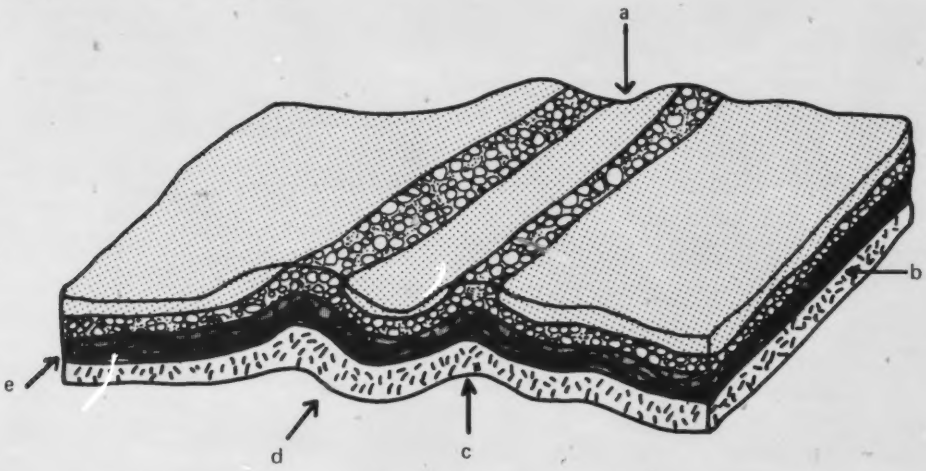
Copy the block diagram below onto your answer sheet.

1. Label the fault line.
2. Using arrows, show the possible directions the rocks could have moved along the fault.



The block diagram below illustrates rock strata that have been compressed into folds. Select the letter of the arrow which indicates the direction of the applied force that caused the rocks to fold.

CP
02-Res 18-1B



The data below concern two different mountains from different mountain chains.

1. Which one do you think is older?
2. Explain your answer.

CP
02-Res 19-1B

CHARACTERISTICS	MOUNT LOWE	MOUNT HIE
Height of peaks	7,000 feet	13,000 feet
Steepness of mountain sides	gentle slopes	very steep
Nature of valley	broad	narrow

Snow can be turned into glacial ice. Describe the process by which this happens.

CP
02-Res 20-1B

Andy suggested that each of the following climate conditions would always result in changing the size of a glacier.

CP
02-Res 21-1B

a. Eighty inches of snowfall per year
b. Snowfall in the winter which is equalled by the loss from melting and evaporation in the summer
c. Snowfall in the winter which is exceeded by the loss from melting and evaporation in the summer
d. Snowfall in the winter which exceeds the loss from melting and evaporation in the summer
e. Ninety inches of snowfall per year

Maria disagreed, saying that only some of those conditions would result in a change in a glacier's size. Which options would cause a glacier's size to change?

Study the list of locations below very carefully.

CP
03-Core-1B

a. The eastern slope of mountain ranges
b. The western slope of mountain ranges
c. The Great Plains area (central USA)
d. Coastal regions

1. Which would be likely source areas of river systems? Choose all the correct answers.
2. What are the reasons for your choices?

Get a blank map of Australia from your teacher. Study the average precipitation map and the elevation map shown below. On the basis of these two maps, where do you think river systems originate in Australia? Show your selections by shading those large general areas for each location on your blank map.

CP
03-Core-2B

Average precipitation in Australia

Elevation map of Australia

KEY	
Symbol	Precipitation (in cm)
	0-25
	26-50
	51-100
	101-150
	151-200

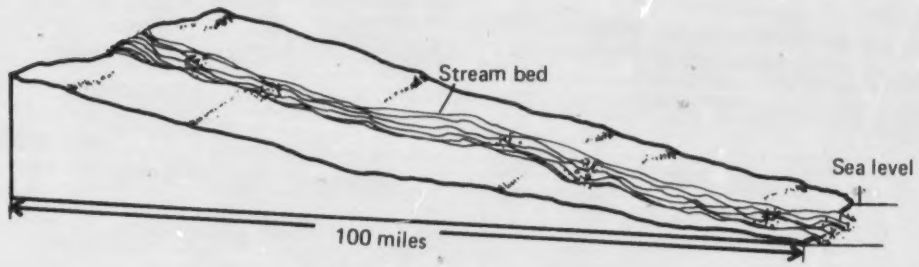
KEY	
Symbol	Elevation (in m)
	1526-2440
	611-1525
	306-610
	0-305

CP
03-Core-3B

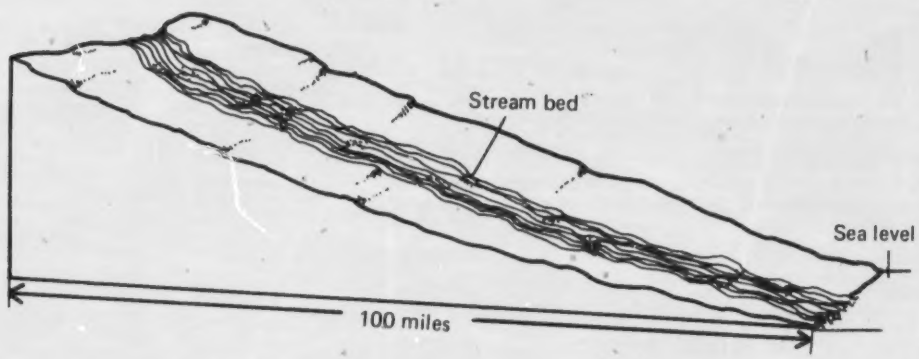
The diagrams below show the profiles of three different streams.

1. Select the diagram which represents the stream with the greatest potential energy?
2. Why did you choose it?

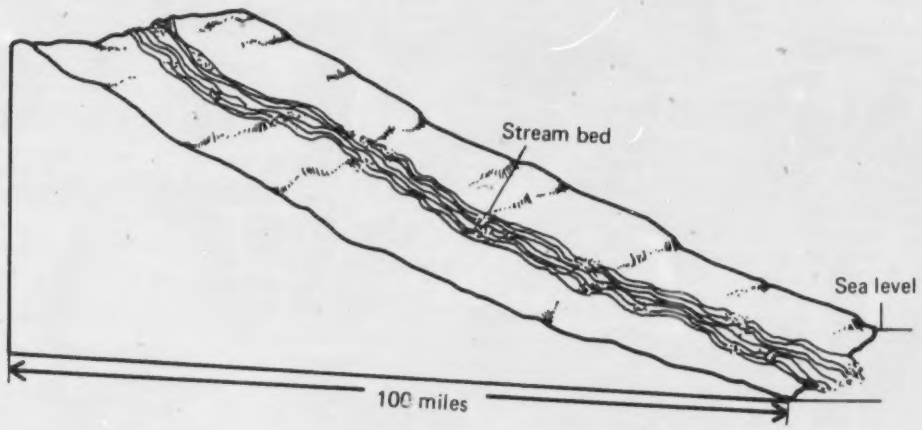
Profile a.



Profile b



Profile c.



CP
03-Core-4B

Get a supply and two catch buckets and a 100-ml beaker from the supply area. Set the water flowing through a stream table into the reservoir at 10 ml/sec without changing the slope of the table. When you think you have the correct flow, ask your teacher to check it.

A stream table was used to determine how long it would take for 50 grams of a sand-gravel mixture to be eroded. The slope of the table was varied, but the amount of water used was the same for each trial. Study the data table below carefully. State how you think the slope of the stream table and the rate of erosion of the stream trough are related.

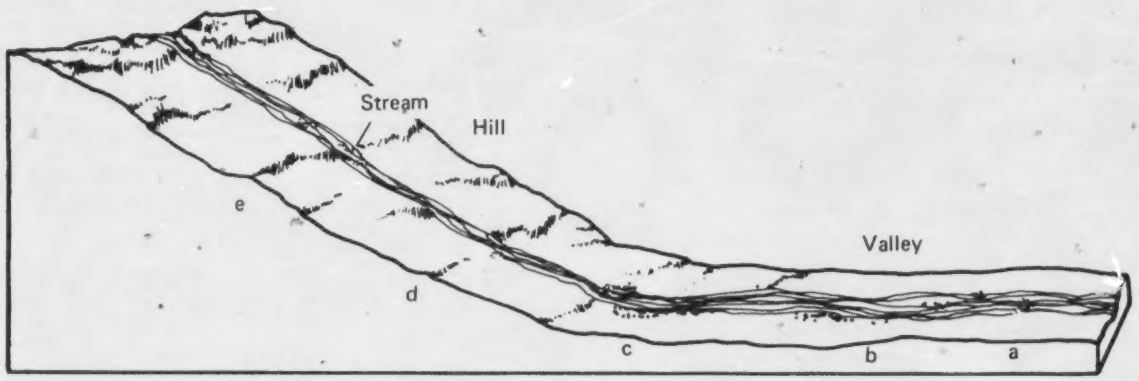
CP
03-Core-5B

HEIGHT OF STREAM TABLE'S UPPER END ABOVE ITS LOWER END (in cm)	TIME TO REMOVE 50 g OF A SAND-GRAVEL MIXTURE (in sec)	
	Trial 1	Trial 2
3	30	31
6	17	16
12	8	7

The diagram below is a profile of a creek.

1. Select the letter which shows where a gravel deposit will most likely occur.
2. Explain your answer.

CP
03-Core-6B



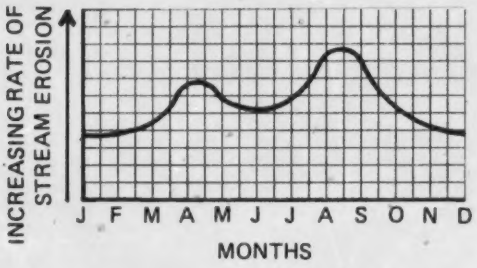
Examine the following list of statements. Each describes a change or an event that could occur in some region of the United States. Write the letter of any of the changes listed below that would almost immediately increase a river's kinetic energy.

CP
03-Core-7B

a. Removal of tree stumps from a stream bed
b. Ten days of snow in January
c. Spring showers on a snowy slope
d. Summer thundershowers

CP
03-Core-8B

The rate of stream erosion has been measured at a certain location on the Alafaya River for one year. The graph below shows the erosion rate at this location. What would be the main cause for decreases or increases in erosion rate as shown on the graph?



CP
03-Core-9B

A stream table is a good model of real rivers. Decide what effects on the stream would follow the changes in the stream table listed below. Get a copy of table CP-03-Core-9B from your teacher. Complete each box of the table by writing + to show that the change increases the effect, – to show that it decreases the effect, and 0 to show that it has no effect.

CHANGE OR DIFFERENCE	POTENTIAL ENERGY	KINETIC ENERGY	EROSION RATE
Lower the starting height			
Rocks in the bed			
Less water			
Steeper slope			
Harder bed			

CP
03-Core-10B

Which of the following features are formed when a river's kinetic energy has been reduced? Choose all the correct answers.

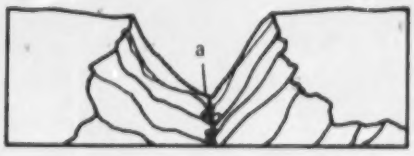
a. Deltas
b. Potholes
c. Gullies
d. Mud bars
e. Stream channels

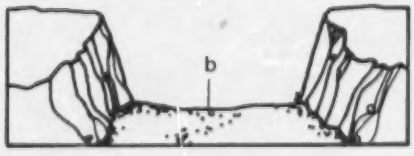
Earth materials are eroded in different ways according to climate and geography. Erosion is often caused by flowing water, wave action, wind, and glaciers. What is the chief cause of erosion at each of the four areas numbered below on the map of the United States?

CP
Core-11B

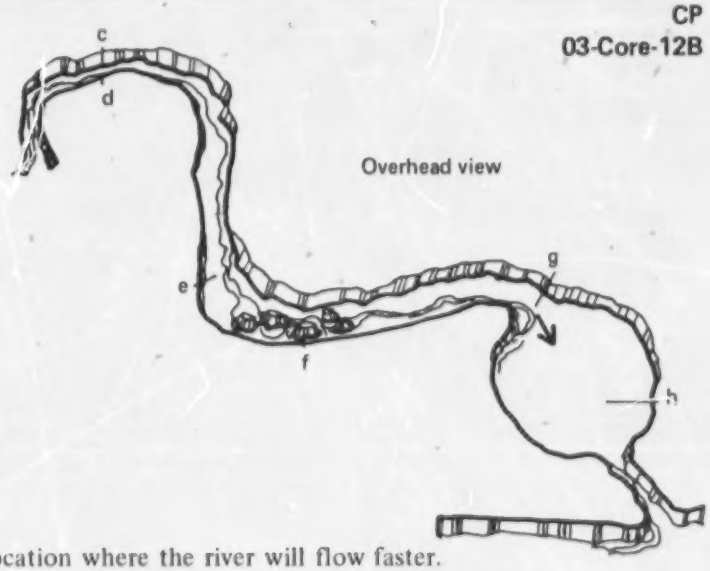
Look at the diagrams below of a river.

CP
03-Core-12B





Front views

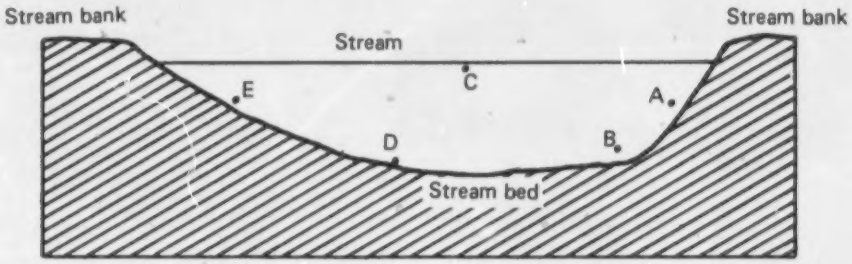


Overhead view

For each of the pairs of letters, select the location where the river will flow faster. Assume that all parts of the river have the same slope.

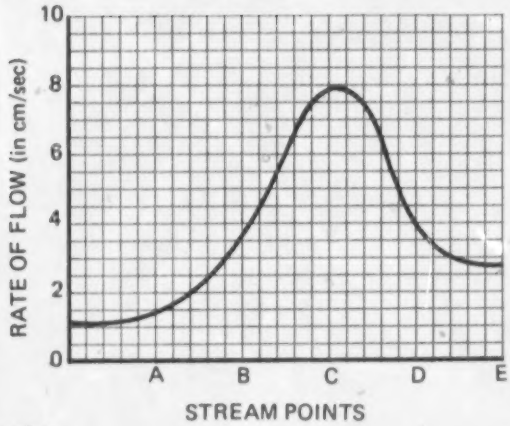
1. Location a or b
2. Location c or d
3. Location e or f
4. Location g or h

CP
03-Res 27-1B

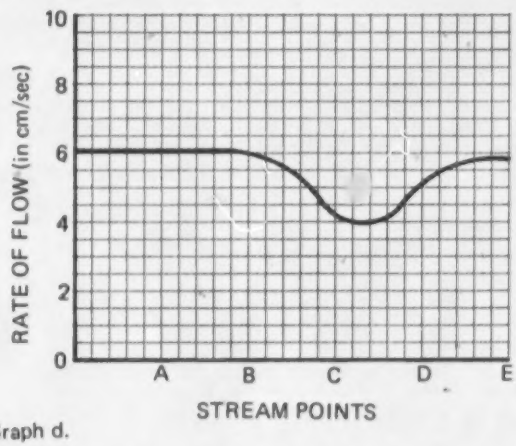


The diagram above shows a cross section of a stream. Below are four graphs showing different rates of flow at each of the five lettered points in the stream. Which graph shows the most likely rates of flow in the stream?

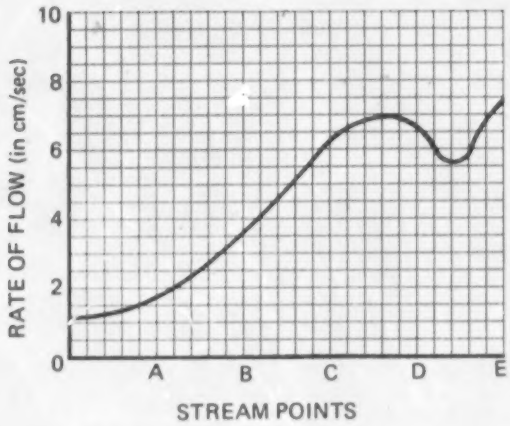
Graph a.



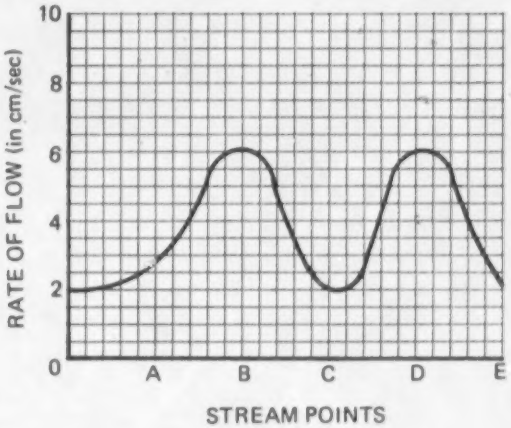
Graph b.



Graph c.



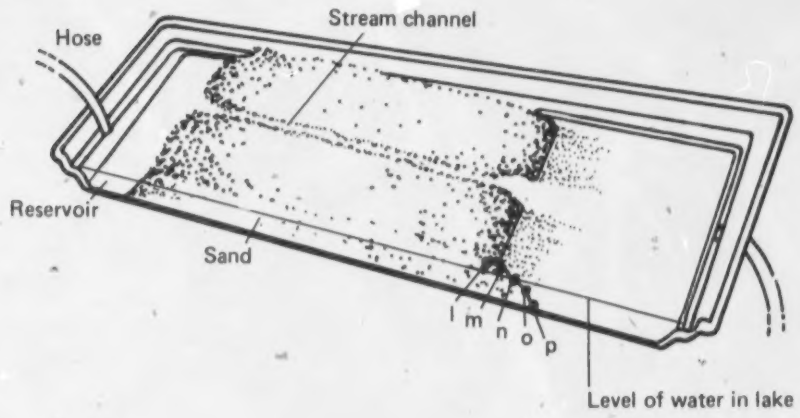
Graph d.



The diagram below shows a stream table setup. Water will be allowed to flow at 7 ml/sec from the reservoir into the stream channel. The level of the water in the lake will be kept constant.

CP
03-Res 29-1B

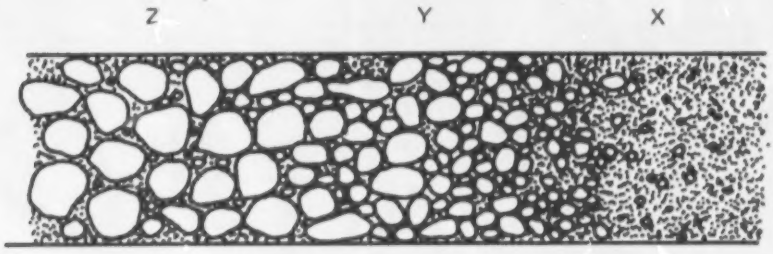
1. Select the maximum depth (l, m, n, o, or p) to which the channel will be cut.
2. Select the letter of the statement below which best explains your choice.
   a. Channel depth is controlled by time.
   b. Channel depth is controlled by the level of the lake.
   c. Channel depth is controlled by the bottom of the stream table.
   d. Channel depth is controlled by the rate of flow.



The diagram below represents a lengthwise section of the river bottom in a delta.

CP
03-Res 32-1B

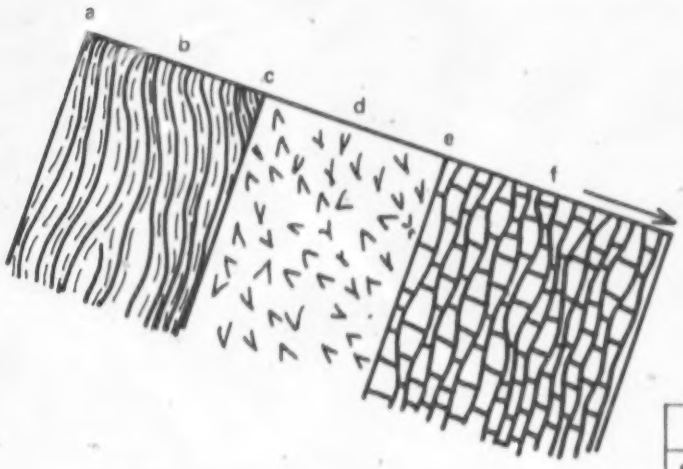
1. Was the water flowing from X to Y to Z at the time the materials were deposited?
2. Explain your answer.



CP
03-Res 33-1B

Look carefully at the diagram of the stream bed and its key below. The arrow shows the direction the water flows.

1. Write the letter of any place where a waterfall could form.
2. State the reason for your choice.



KEY	
Symbol	Rock
	basalt
	shale
	limestone

CP
03-Res 34-1B

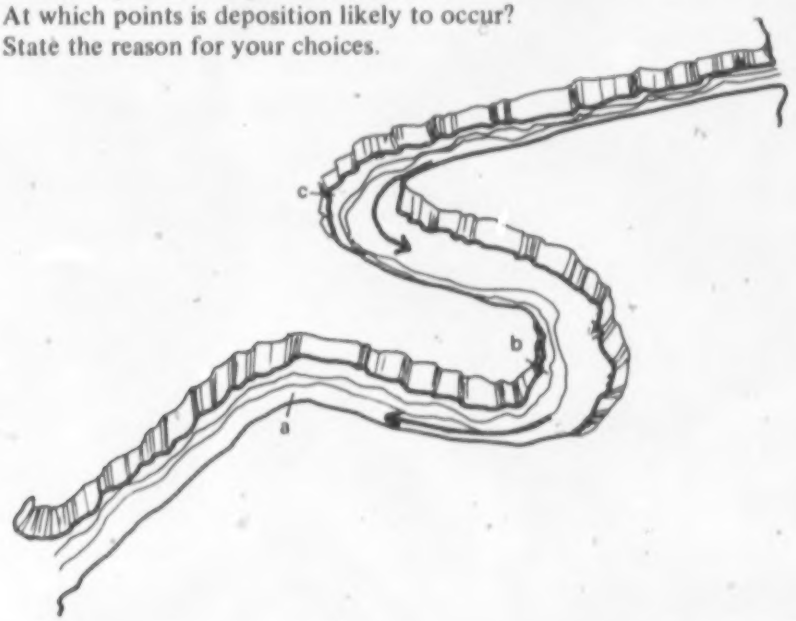
The map below shows the paths of several gullies. Copy this map onto your answer sheet or use the one provided by your teacher.

1. Use an arrow labeled *flow* to show the direction that water flows in one of the gullies.
2. Use an arrow labeled *growth* to show the direction in which one of the gullies will tend to grow.

The diagram below shows the path of a river and three lettered points along its course. Arrows mark the direction the water flows.

CP
03-Res 36-1B

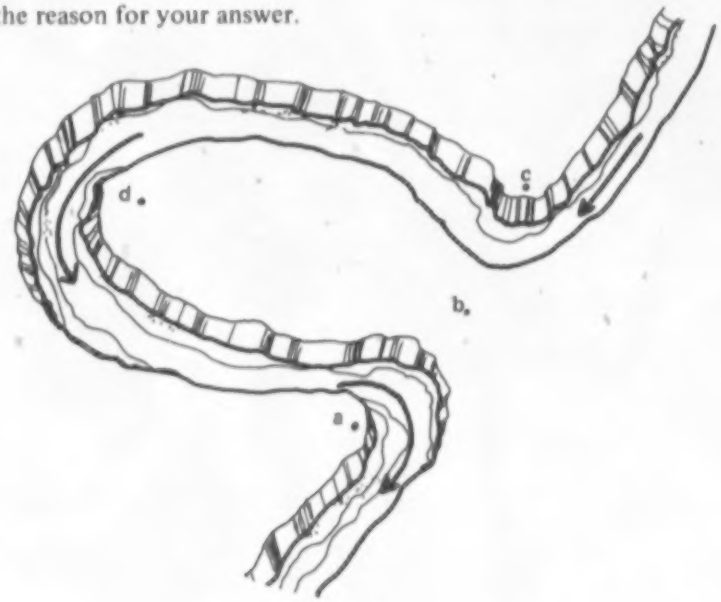
1. At which points is erosion likely to occur?
2. At which points is deposition likely to occur?
3. State the reason for your choices.



The diagram below shows a meander in a stream.

CP
03-Res 36-2B

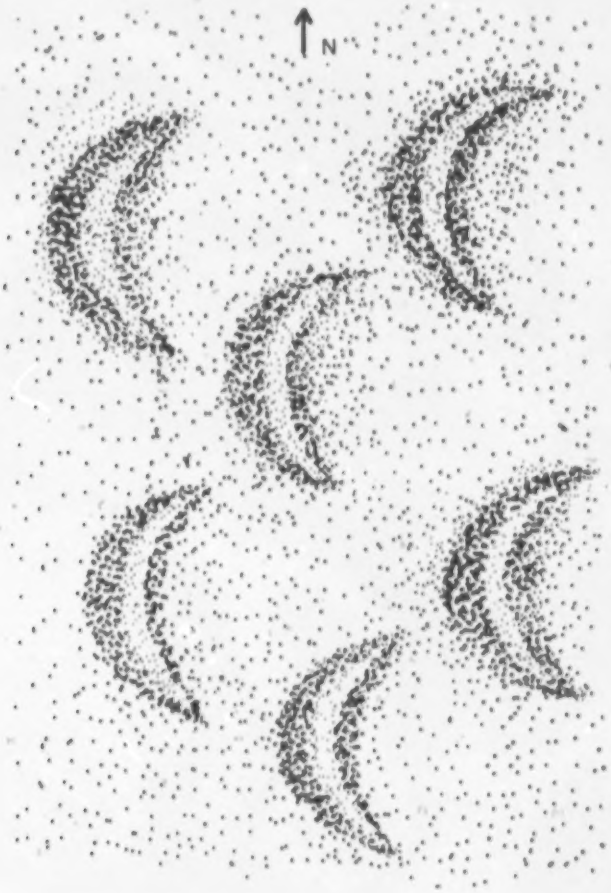
1. Which of the four land areas represented by letters will probably be eroded first?
2. Explain the reason for your answer.



CP
03-Res 37-1B

This relief map below shows sand dunes.

1. From which direction does the prevailing wind blow?
2. State your evidence from the map.



Examine the two diagrams below. **CP 04-Core-1B**

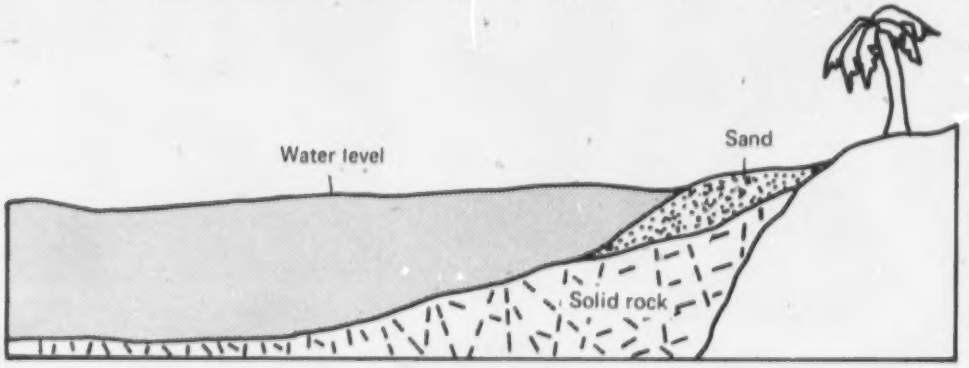
1. Select the letter of the diagram showing a beach which has been attacked by high-energy waves.
2. State the evidence that supports your answer.

Diagram a.

Diagram b.

The diagram below shows a shoreline with a sand beach and the water level at low tide. Suppose that a hurricane with high winds and waves pounded against the beach for several hours. **CP 04-Core-2B**

1. What would happen to the beach and its sand?
2. Include in your answer a diagram of the area after the hurricane is over.



Study the three changes along a shoreline listed below. For each change, state whether it is evidence of high-energy wave action or low-energy wave action. **CP 04-Core-3B**

1. Sand piled up around bulkheads and pilings
2. Exposed rock and coarse gravel
3. Accumulation of sand offshore, a bench

CP
04-Core-4B

The diagrams below show how a stream table can be used to show the formation of a sand beach. Diagram A shows the setup before waves are produced. Diagram B shows the same setup after the waves ceased.

1. How were these waves produced in the stream table?
2. What is an important variable in the formation of the beach?

Diagram A.

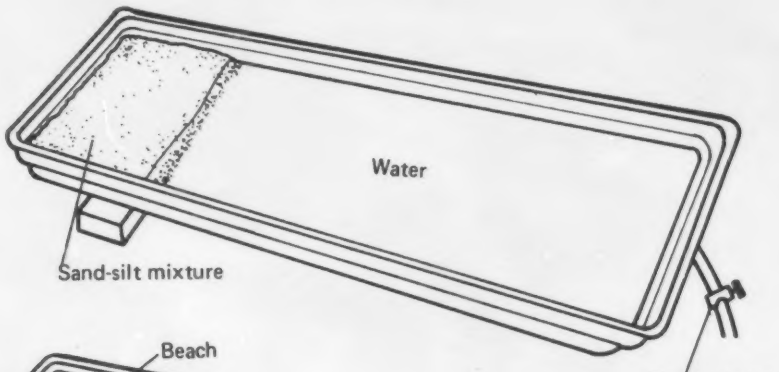
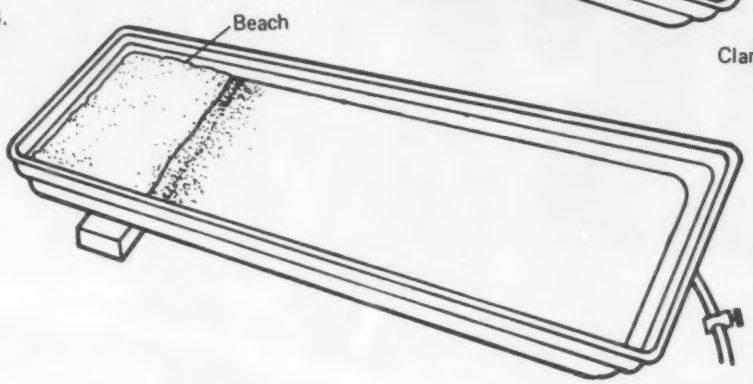


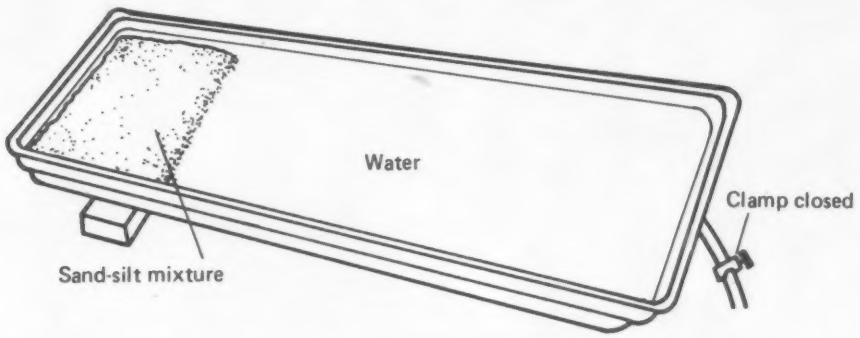
Diagram B.



CP
04-Core-5B

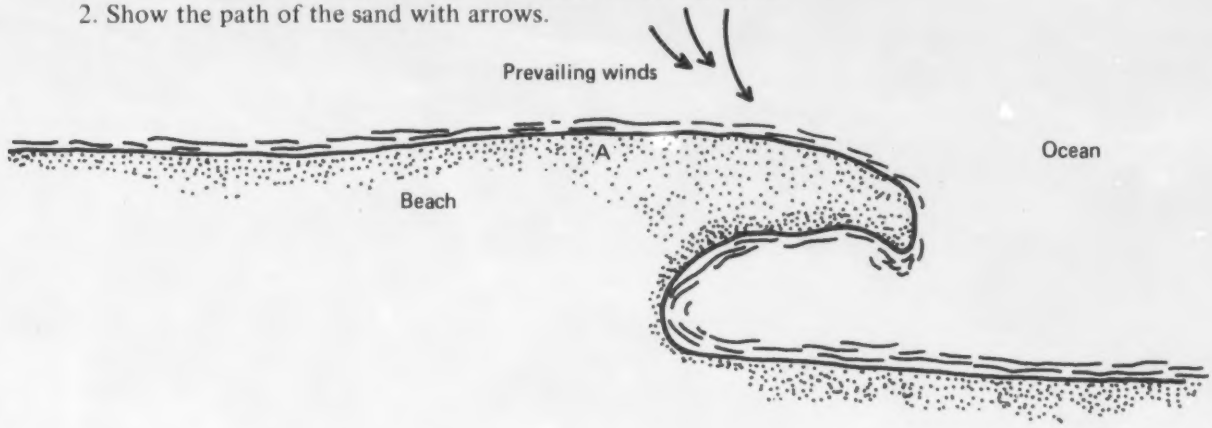
Set up a stream table as shown below. Secure any additional equipment you may need.

1. Produce waves that will result in the production of a sand bench. Show your teacher how you do this.
2. What important variable is needed to produce the sand bench?



Copy the diagram below, or get a copy of it from your teacher. Suppose waves erode sand at point A. **CP 04-Core-6B**

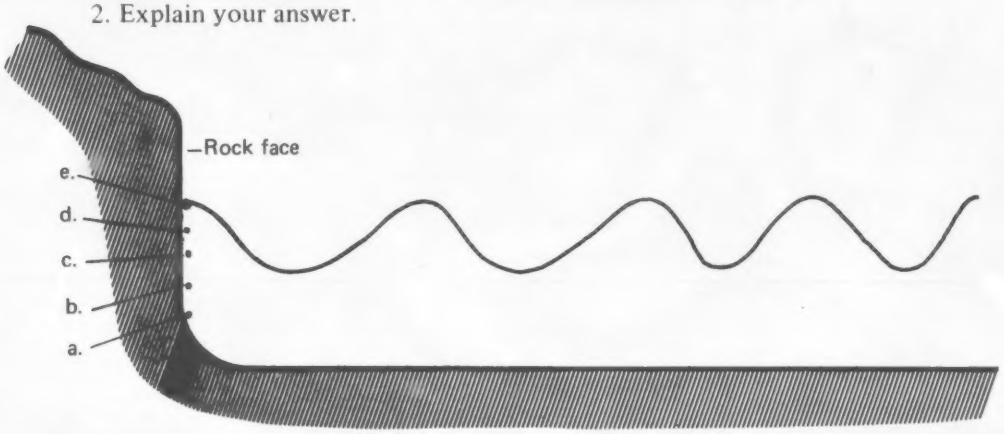
1. Shade in the place most of the sand is likely to be deposited.
2. Show the path of the sand with arrows.



The strait between British Columbia and Washington is a fiord. Chesapeake Bay on the East Coast of the United States is an estuary. What is the difference between a fiord and an estuary? **CP 04-Core-7B**

The diagram below shows waves hitting a rocky coastline. **CP 04-Res 38-1B**

1. Where will erosion of the rock face by these waves be greatest?
2. Explain your answer.



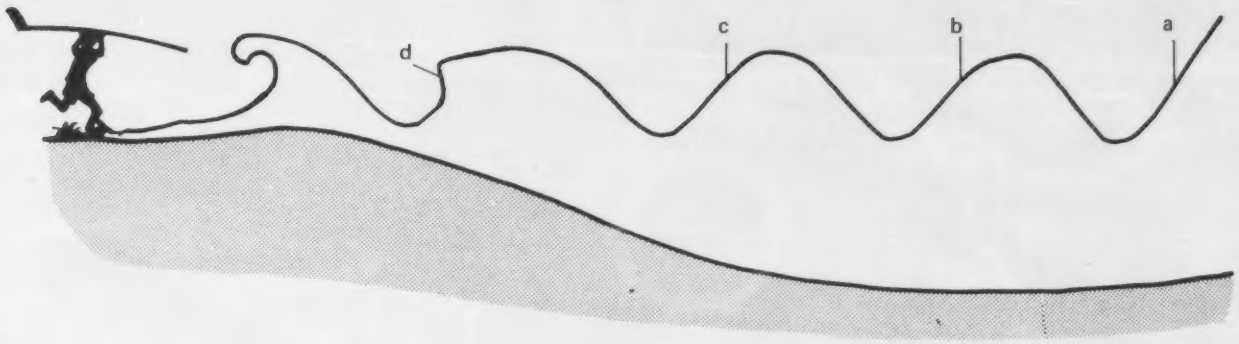
The following are features that are formed along shorelines. Select any of the features which are commonly associated with rocky or steeply inclined shorelines. **CP 04-Res 38-2B**

a. Pinnacles
b. Deltas
c. Benches
d. Caves
e. Spits

CP
04-Res 39-1B

Choosing the right wave at the right spot is important to a surfer.

1. Which lettered wave shown in the diagram below would give a surfer the best ride?
2. Explain why your choice is best and why you did not select the other waves.



CP
04-Res 40-1B

Study the three diagrams below of ocean waves approaching different shorelines.

1. Write the letter of any diagram which shows conditions for the bending of waves by diffraction.
2. Write the letter of any diagram which shows conditions for the bending of waves by refraction.
3. Explain your answers to parts 1 and 2.

Diagram a.

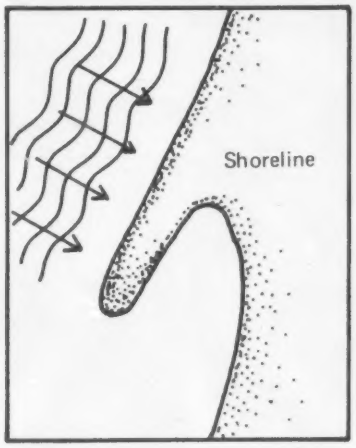


Diagram b.

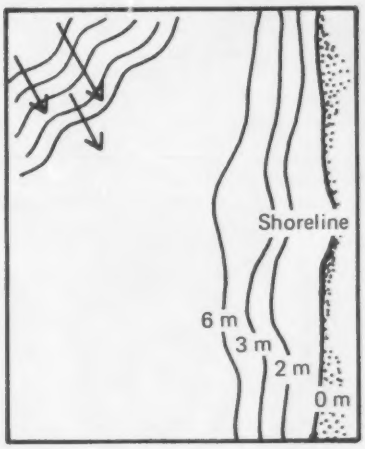
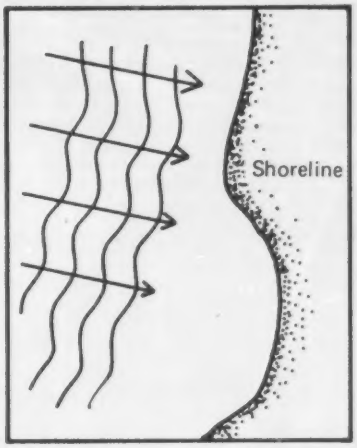


Diagram c.



Copy the diagrams below, or get copies of them from your teacher. Diagram 1 shows wave fronts approaching a bay. Diagram 2 shows wave fronts approaching a headland. Draw in more wave fronts on each diagram to show changes in the shape of the fronts that would occur as they move shoreward.

CP
04-Res 40-2B

Diagram 1.

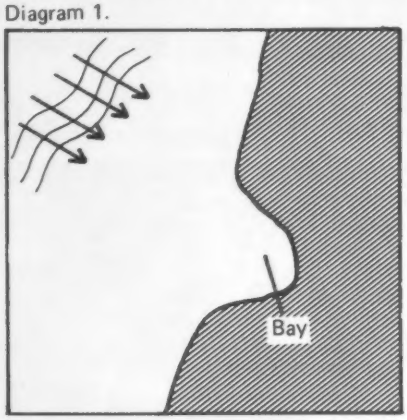
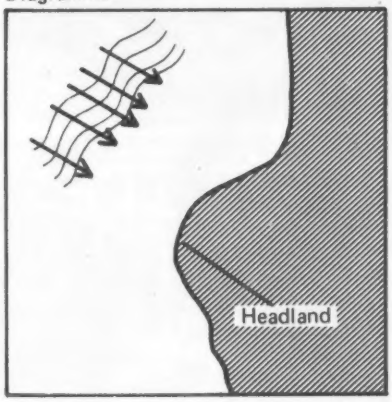


Diagram 2.



Copy the diagrams below, or get copies of them from your teacher. Diagram 1 shows wave fronts approaching an opening between two barriers. Diagram 2 shows wave fronts approaching a single barrier. Draw more wave fronts toward the land to show any probable changes in their direction as they move shoreward past the barriers.

CP
04-Res 40-3B

Diagram 1.

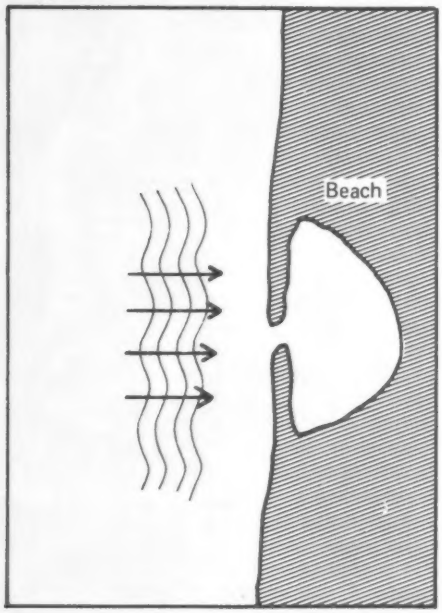
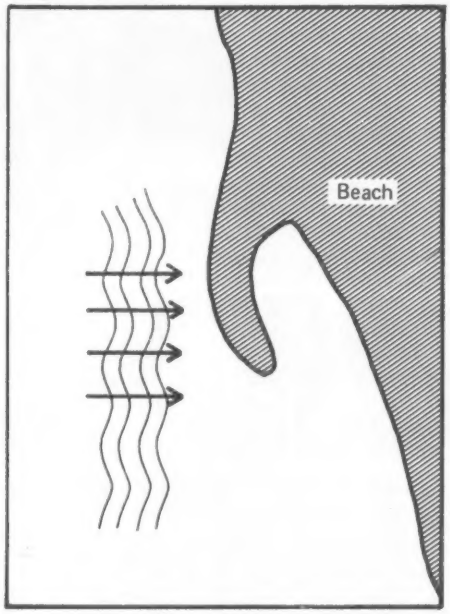


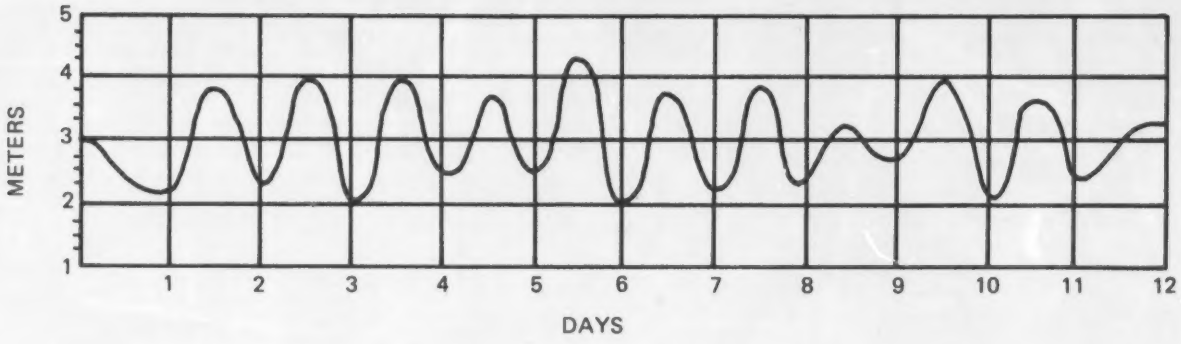
Diagram 2.



CP
04-Res 42-1B

The graph below shows the tidal record at Beaufort Island for 12 days.

1. Estimate the mean sea level at Beaufort Island. (Estimate it; do not calculate it.)
2. Which group of readings did you consider to estimate the mean sea level?



CP
04-Res 43-1B

Select the diagram below which shows the relationship among the sun, the moon, and the earth which would result in the highest ocean tides.

Diagram a.

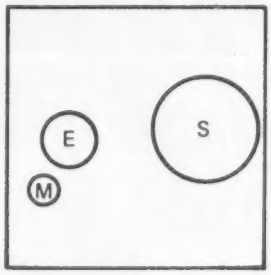


Diagram b.

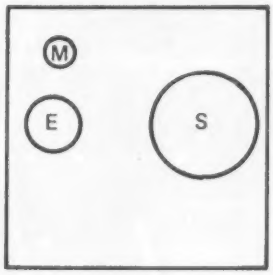
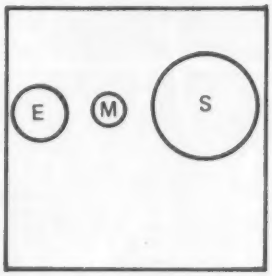
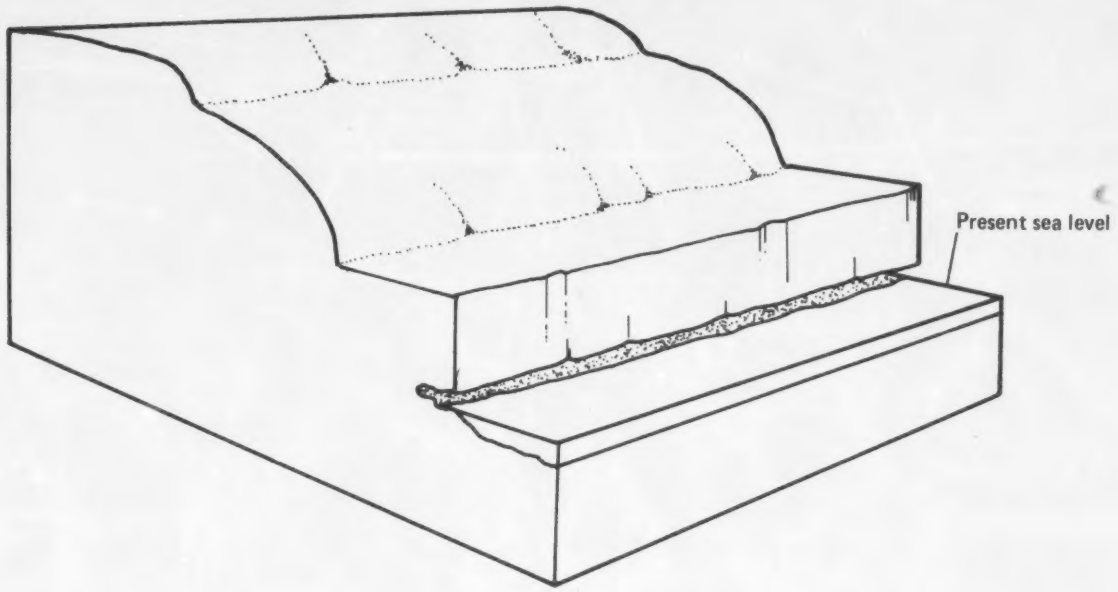


Diagram c.



Study the coastline and the benches (steps) shown in the diagram below. **CP**

1. What caused the benches on this beach? **04-Res 44-1B**
2. Explain why there are several benches.



Look at the diagram of a coastline below. Suppose sandstone from area X is eroded. **CP**

1. What is the letter of the arrow which indicates the direction the resulting sand is likely to take? **04-Res 46-1B**
2. What will the deposited sand form?